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SITE SELECTION & revised ENVIRONMENTAL IMPACT STATEMENT FOR KAILUA-KEAUHOU ELEMENTARY SCHOOL

Kona, Hawaii

May 1978

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KAILUA-KEAUHOU ELEMENTARY SCHOOL
SITE SELECTION
AND
ENVIRONMENTAL IMPACT STATEMENT
Revised

PREPARED BY
PLANNING BRANCH

DIVISION OF PUBLIC WORKS
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
MAY 1978

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KAILUA-KEAUHOU ELEMENTARY SCHOOL
SITE SELECTION
AND
ENVIRONMENTAL IMPACT STATEMENT

CHAPTER 1
INTRODUCTION

PROJECT BACKGROUND

The Department of Education (DOE) has projected the need for a new elementary school in the Kailua-Keauhou area in Kona on the island of Hawaii. The new school is required to preclude excessive enrollment levels at Kealakehe Elementary. Continuous enrollment growth has occurred at Kealakehe School for the past several years and is projected to continue at or near current rates, stimulated in part by State and private housing development proposals for the North Kona area. The current enrollment projections for Kealakehe School are shown in Table 1.

TABLE 1
ENROLLMENT PROJECTIONS a/

Year	Kealakehe 7-8	Kealakehe K-6	Kailua-Keauhou K-6	Total
1975	201	783	-	984 b/
1976	213	803	-	1,016 b/
1977	239	837	-	1,076
1978	248	877	-	1,125
1979	250	926	-	1,176
1980	315 c/	641	330	1,286
1981	325	665	354	1,344
1982	344	686	378	1,408
1985	350	720	420	1,490
1990	400	760	520	1,680
1995	430	800	630	1,860

a/ March 18, 1977 data from the Department of Education Facilities Branch.
b/ Actual enrollments.
c/ First year for the transfer of Holualoa 7-8th grades.

KONAWAENA HIGH EDUCATIONAL COMPLEX

The proposed school will be part of the Konawaena Educational Complex shown in Figure 1. The existing and proposed Konawaena

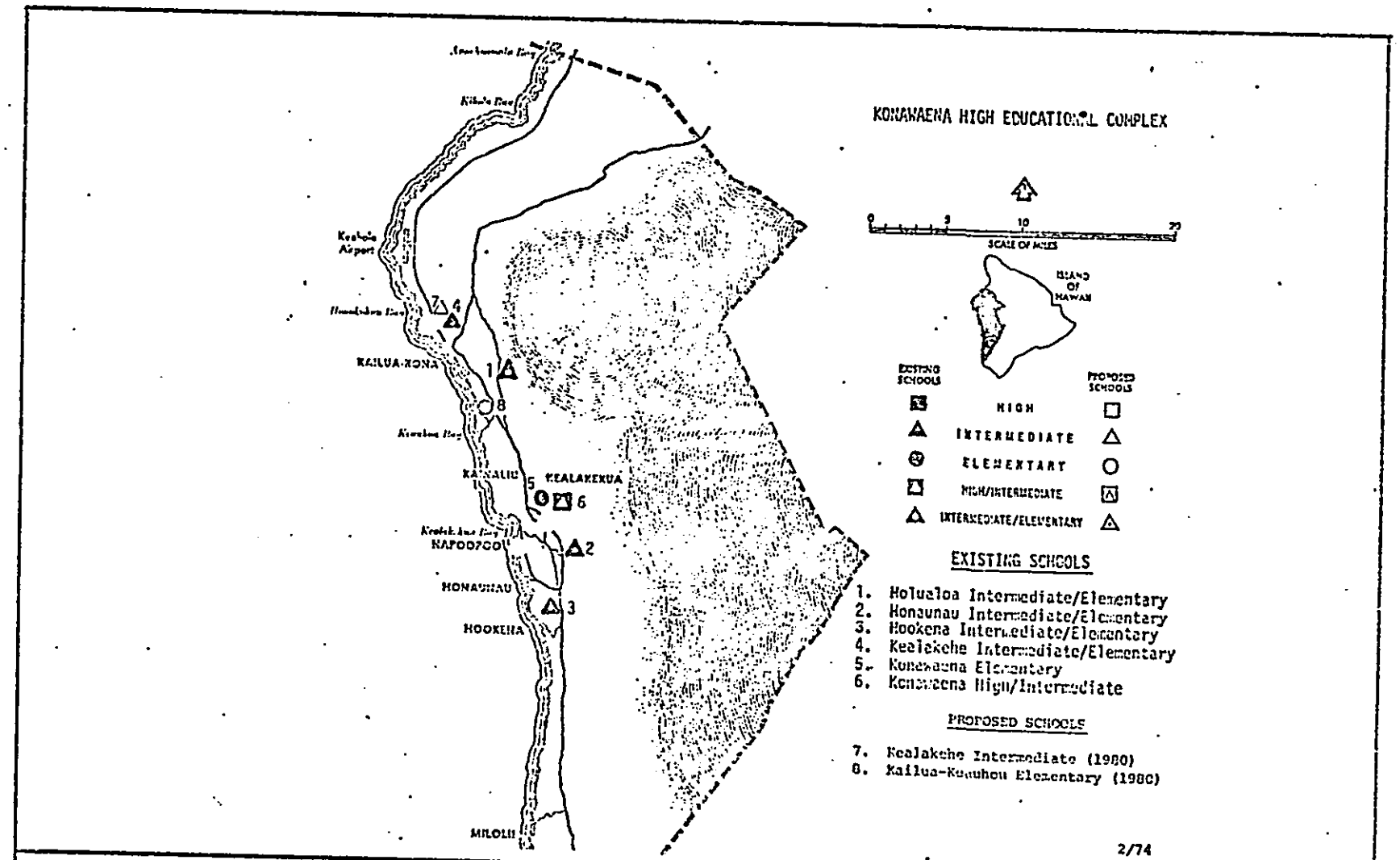


FIGURE 1	KONAWAENA EDUCATIONAL COMPLEX MAP
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

Educational Complex Organizations are provided in Figure 2. Enrollment in the Konawaena Complex increased by approximately 800 students between 1966 and 1975. This growth was due primarily to in-migration from the mainland and other areas of the State. The DOE projects further enrollment gains if resort-oriented development continues at or near the rate of recent years. The 3,424 enrollment for 1975 is expected to increase to approximately 4,200 by 1995.

Based on these projections, the existing Kealakehe School will ultimately be separated into an elementary and intermediate school. The existing Holualoa School will be retained to service the mauka K-6 students along Mamalahoa Highway and will drop the 7-8 graders to Kealakehe Intermediate. The new Kailua-Keauhou Elementary School and the existing Kealakehe Elementary will serve the K-6 students from the makai area.

KAILUA-KEAUHOU ELEMENTARY SERVICE AREA

The Kailua-Keauhou Elementary School will serve the students within the proposed school service area shown in Figure 3. The school is scheduled to open in 1980 with approximately 330 students from the homes along Alii Drive between Kailua and Keauhou. By 1985, an additional 90 students will be added from homes along Kuakini Highway between Kailua and Kamehameha Road. An enrollment of 520 students is expected by 1990 and 630 students by 1995. The design enrollment is being set for 630 students.

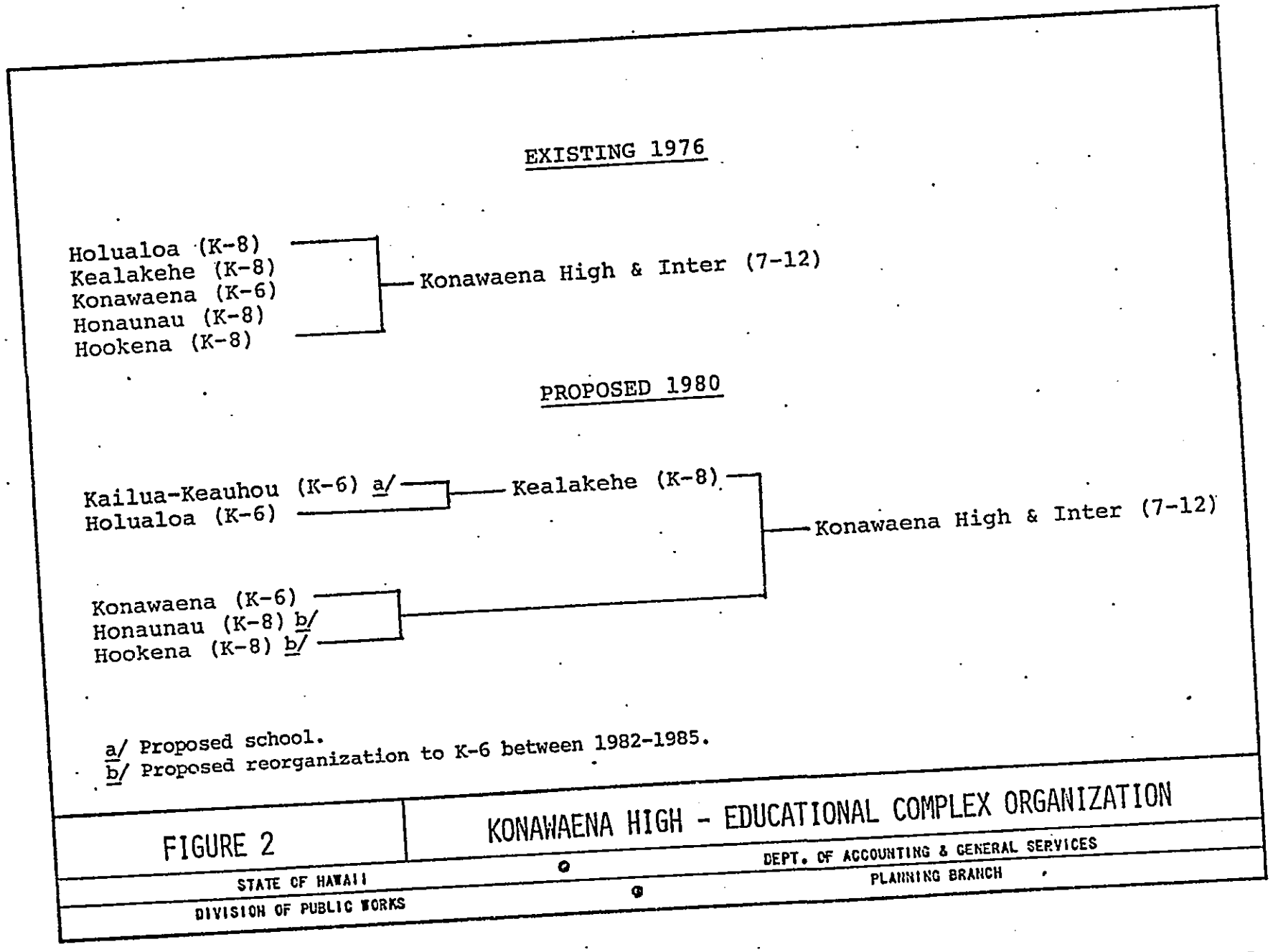


FIGURE 2 — KONAWAENA HIGH - EDUCATIONAL COMPLEX ORGANIZATION

STATE OF HAWAII — DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS — PLANNING BRANCH

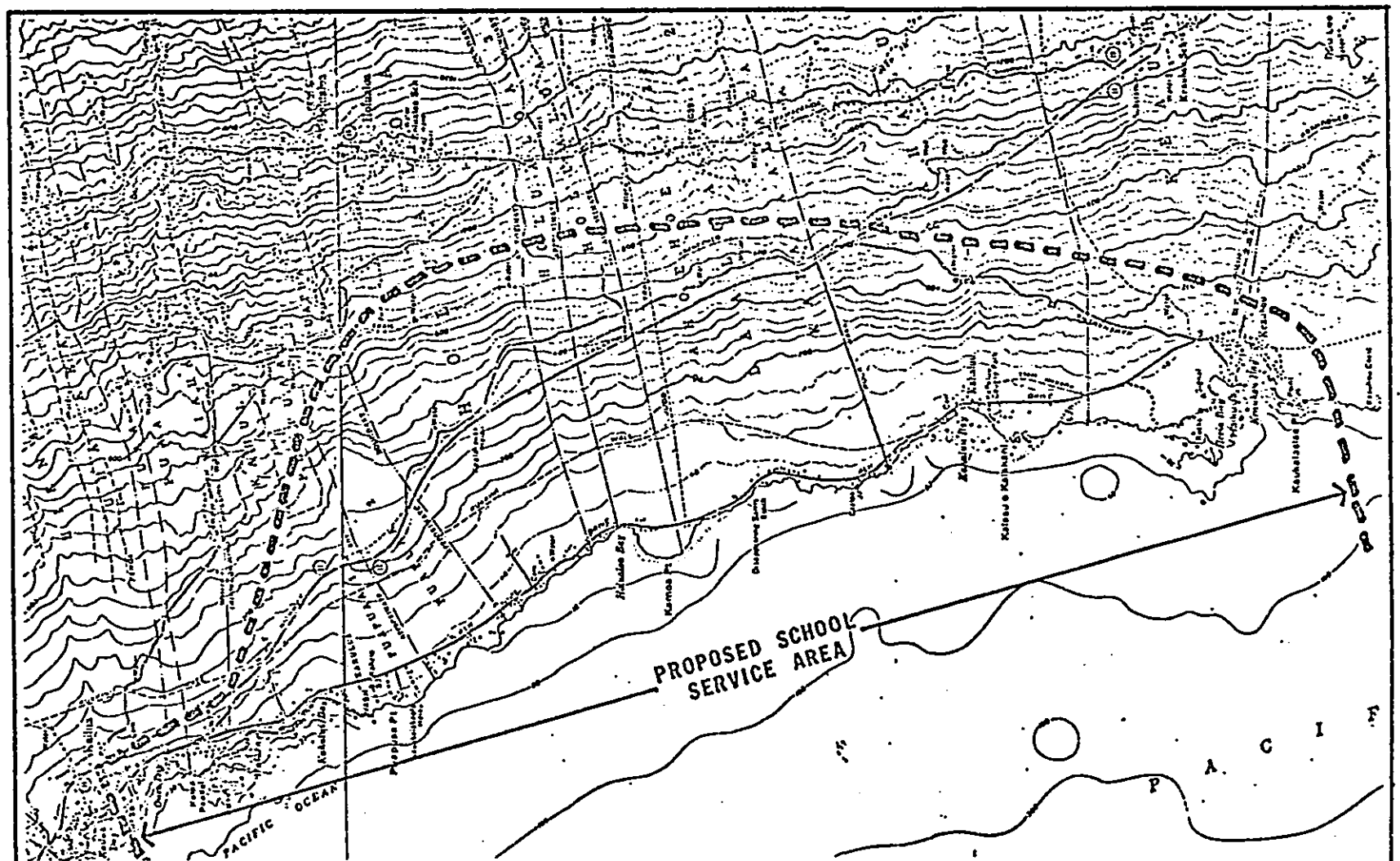


FIGURE 3	SCHOOL SERVICE AREA
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

CHAPTER 2
SELECTION OF ALTERNATIVE SITES

ALTERNATIVE SITES

The alternative sites selected for this study are shown in Figure 4. They were selected after considering all possible sites and eliminating those which generally did not meet the following criteria:

A. Within the school service area.

B. Outside potential flood plain.

C. Outside potential tsunami inundation zone.

D. Under 12% slope.

E. Within or adjacent to SLU urban zone.

F. Accessible by existing or proposed roads.

G. Avoids designated historical sites.

Alternative Sites A through H were initially selected and evaluated for the proposed school. Alternative Sites 1 and 2 were included in the study after the initial 8 sites were reviewed by selected agencies, community organizations, and property owners. The reasons for including the two additional sites are as follows:

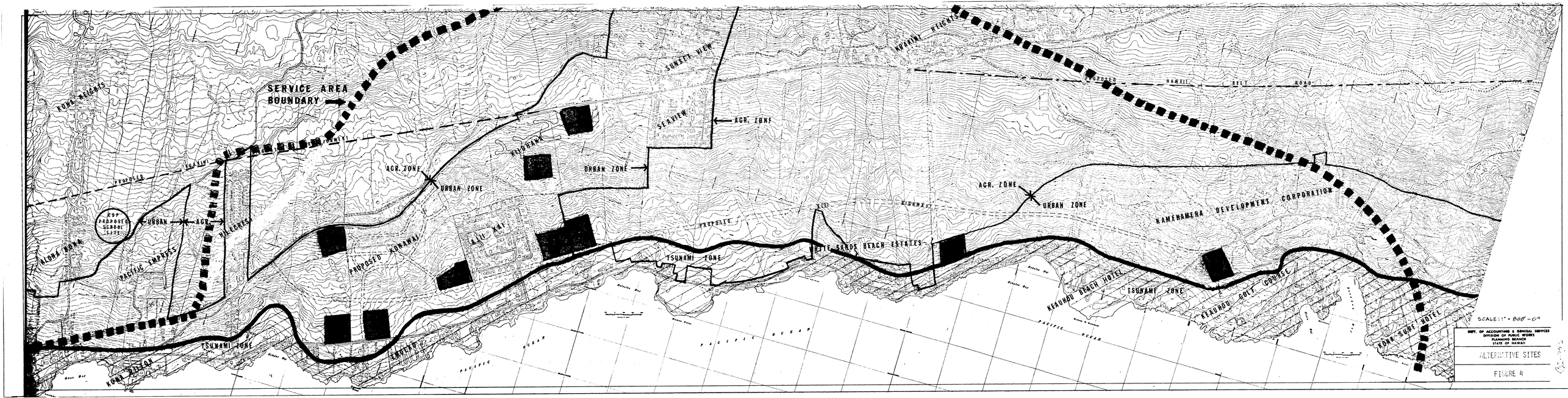
1. Site 1 - This site essentially has the same characteristics as Site B and was included in the study because of the concerns raised by the property owner regarding the impact of Site B on his development plans.

2. Site 2 - This site was proposed by the owner/developer of Site H as an alternative site which could be made available to the State.

It should be noted that the Hawaii County's Kona Community Development Plan recommends an elementary school site be located on Tax Map Key 7-5-10:8. However, the proposed site is outside of the school service area boundary established by the Department of Education and is therefore not included as an alternative site.

DESCRIPTION OF ALTERNATIVE SITES

The details of each alternative site selected in this study are provided in Tables 2 through 11 and Figures 5 through 34. More detailed data on the alternative sites is provided in Chapter 3.



DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

ALTERNATIVE SITES

FIGURE 4

TABLE 2
ALTERNATIVE SITE A
DATA SHEET

Area: 7 acres of a 166.5606-acre parcel.

SLU District: Urban

County: General Plan - Alternate Urban
Zoning - Unplanned

TMK: 7-5-20:portion 01 (Figure 5)

Owner: Kobayashi Development Co., Inc. (A/S)

Current Use: Undeveloped

Average Slope: 2% (Figure 6)

Access Road: Proposed Alii Highway and proposed "Konawai" Development roadways.

Vegetation: Kiawe, haole koa, opiuma, grasses.

Photograph: (Figure 7)

Remarks: This site was suggested by the landowner-developer for the parcel. Since there is no established schedule for the construction of the proposed roadways, it will be necessary to construct a portion of the proposed Alii Highway to provide access to the site.

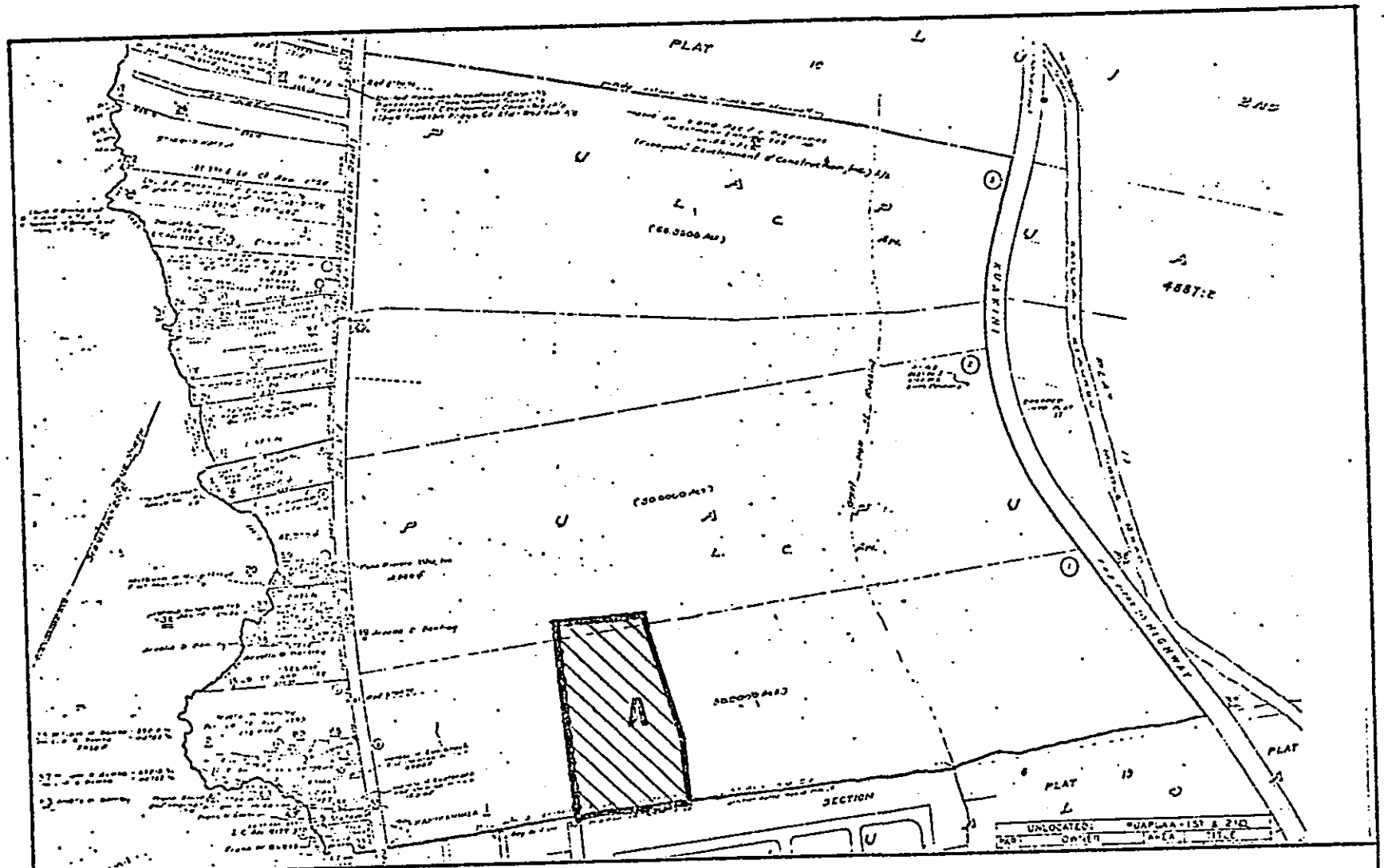


FIGURE 5	SITE A - TAX MAP KEY: 7-5-20:Por. 1
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

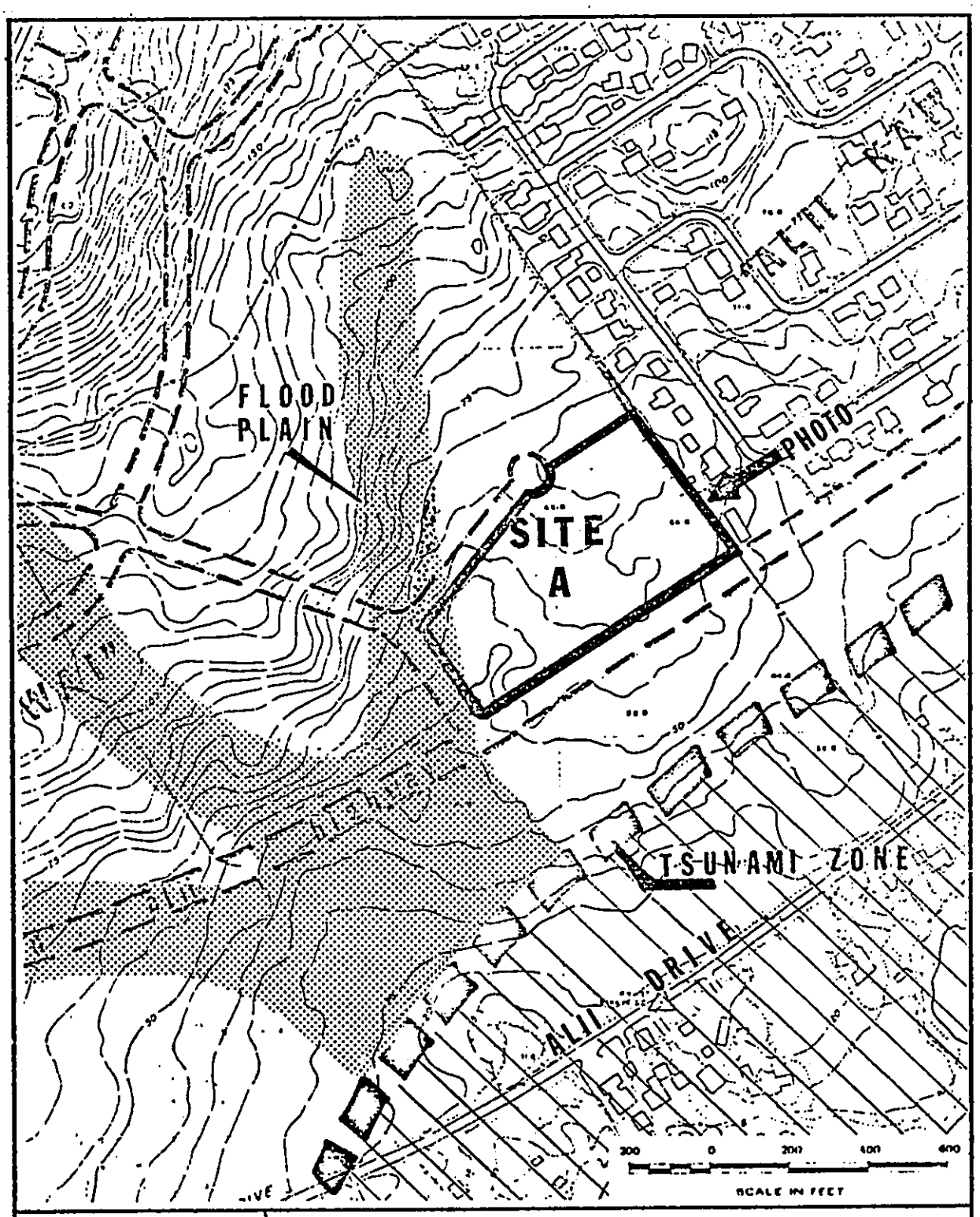


FIGURE 6	ALTERNATIVE SITE A

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

TMK: 7-5-20:01

FIGURE 7	PHOTOGRAPH OF ALTERNATIVE SITE A
STATE OF HAWAII • DIVISION OF PUBLIC WORKS	DEPT. OF ACCOUNTING & GENERAL SERVICES • PLANNING BRANCH

TABLE 3
ALTERNATIVE SITE B
DATA SHEET

Area: 7 acres of a 166.5606-acre parcel.

SLU District: Urban

County: General Plan - Resort
Zoning - Unplanned

TMK: 7-5-20:portion 01 (Figure 8)

Owner: Kobayashi Development Co., Inc. (A/S)

Current Use: Undeveloped, possible grazing.

Average Slope: 4% (Figure 9)

Access Road: Existing Alii Drive and proposed "Konawai" Development roadways.

Vegetation: Kiawe, haole koa, opiuma, grasses.

Photograph: (Figure 10)

Remarks: This is an alternate site to the suggested Site A but is accessible from the existing Alii Drive.

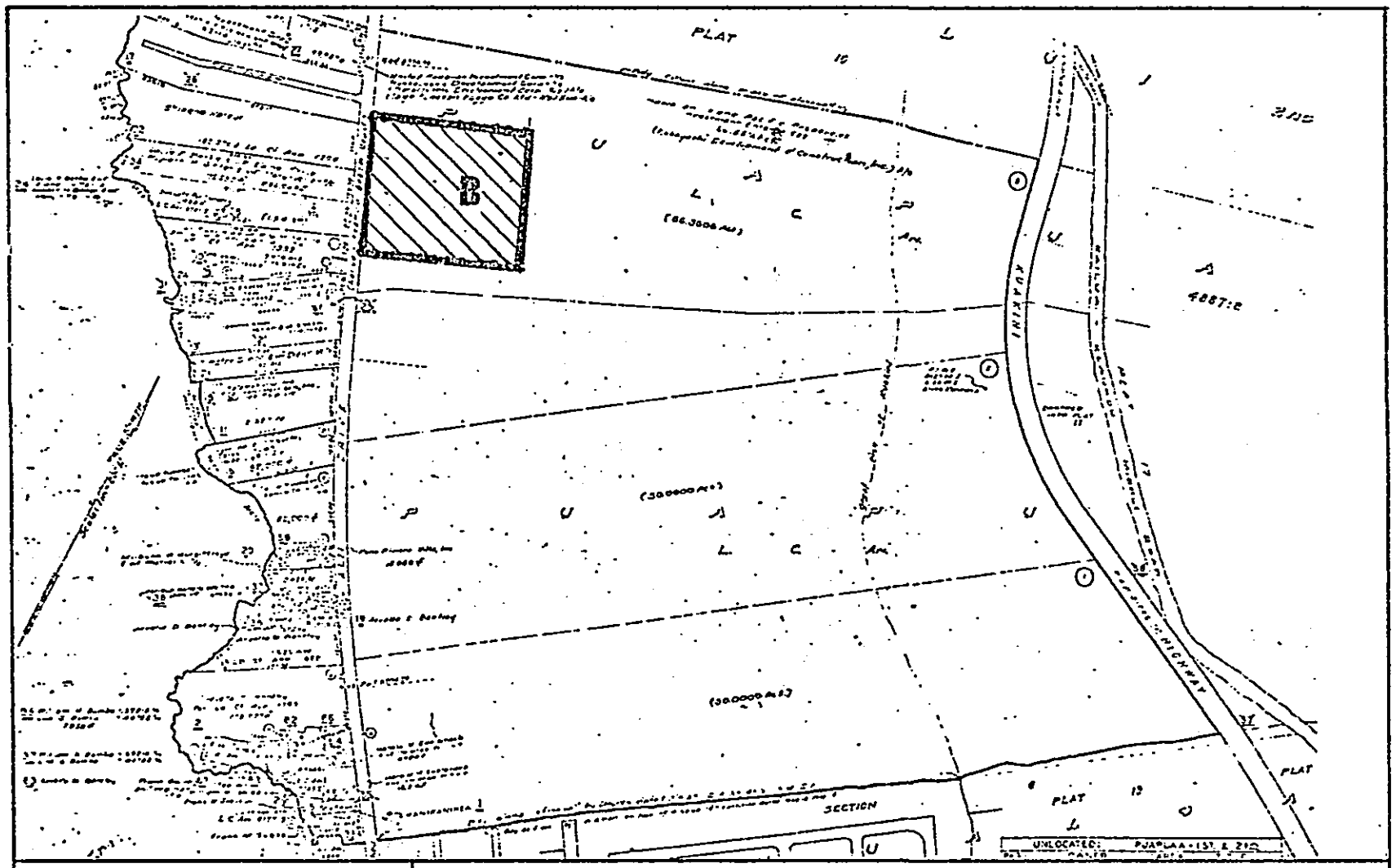


FIGURE 8	SITE B - TAX MAP KEY: 7-5-20:Por. 1
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

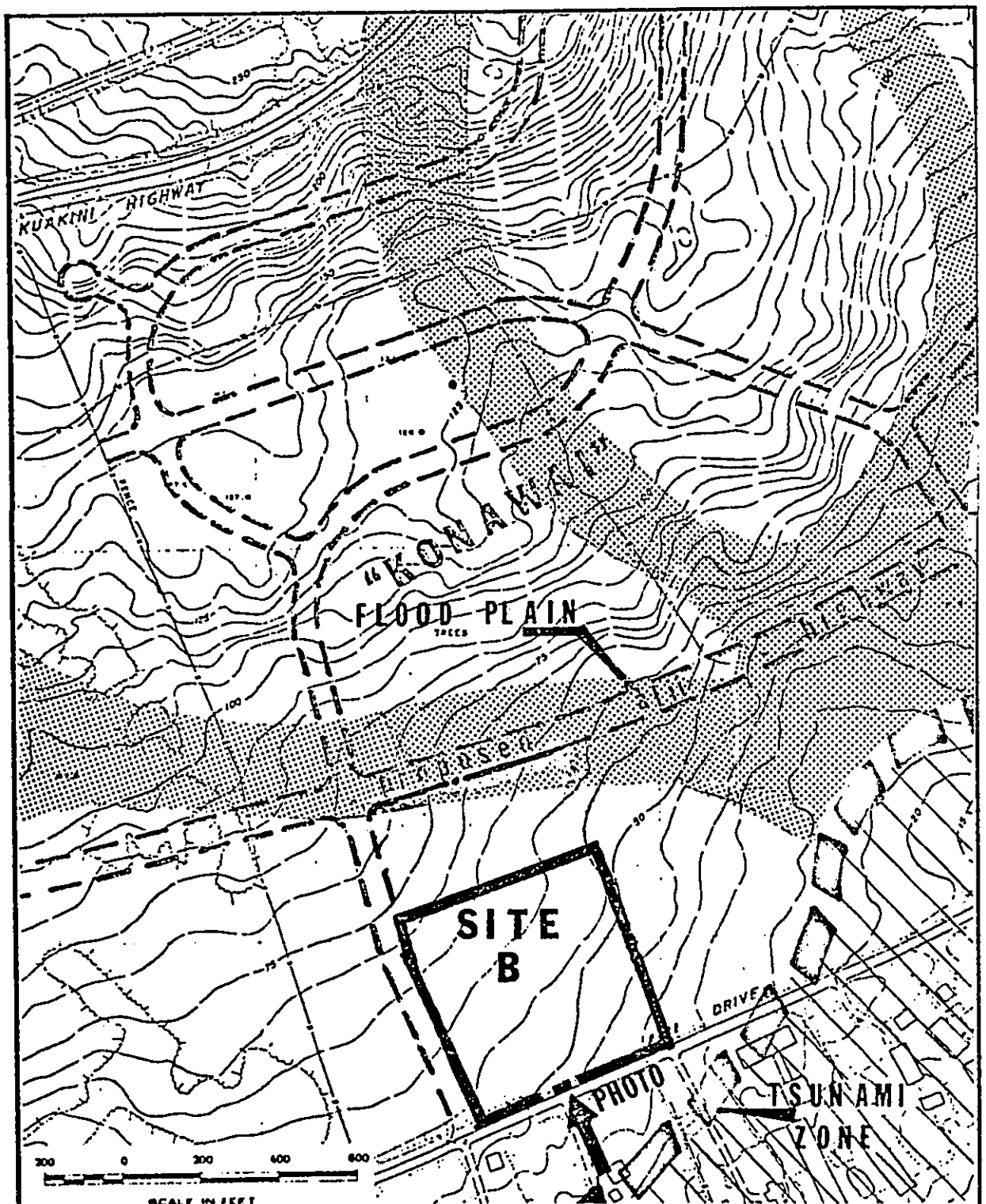
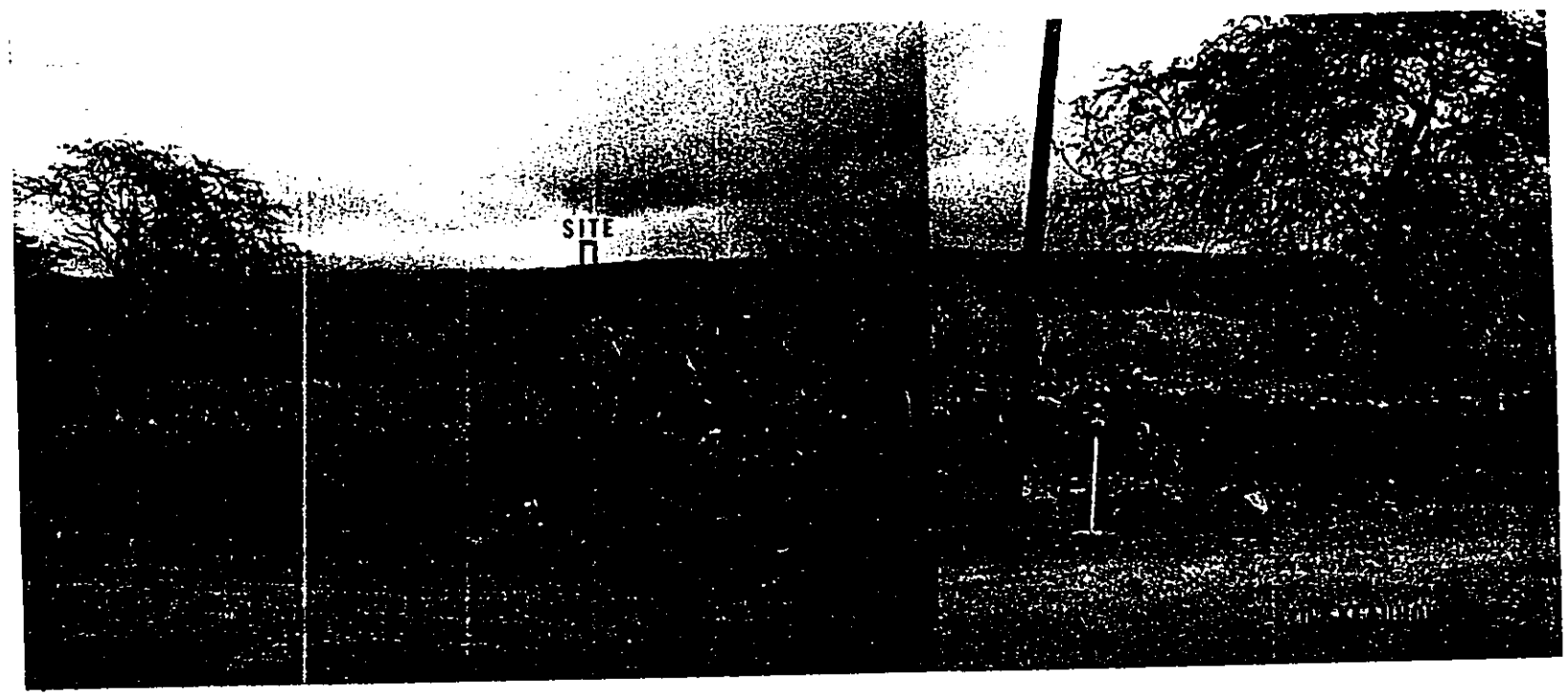


FIGURE 9	ALTERNATIVE SITE B
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH



TMK: 7-5-20:01

FIGURE 10	PHOTOGRAPH OF ALTERNATIVE SITE B
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

TABLE 4
ALTERNATIVE SITE C
DATA SHEET

Area: 7 acres of a 80.992-acre parcel.

SLU District: Urban

County: General Plan - Alternate Urban
Zoning - Unplanned

TMK: 7-5-19:portion 01 (Figure 11)

Owner: Chiaki Matsuo (A/S)

Current Use: Grazing

Average Slope: 6% (Figure 12)

Access Road: Existing Kuakini Highway.

Vegetation: Kiawe, haole koa, opiuma, grasses.

Photograph: (Figure 13)

Remarks: Access from Kuakini Highway is hazardous based on current traffic conditions, and will be worse if the highway is upgraded to a major highway along the existing corridor. However, if the new highway is realigned mauka of the existing road as proposed, the possibility of providing access from Kuakini is good. A secondary access could also be provided from the proposed Alii Highway and the proposed "Konawai" development roadways.

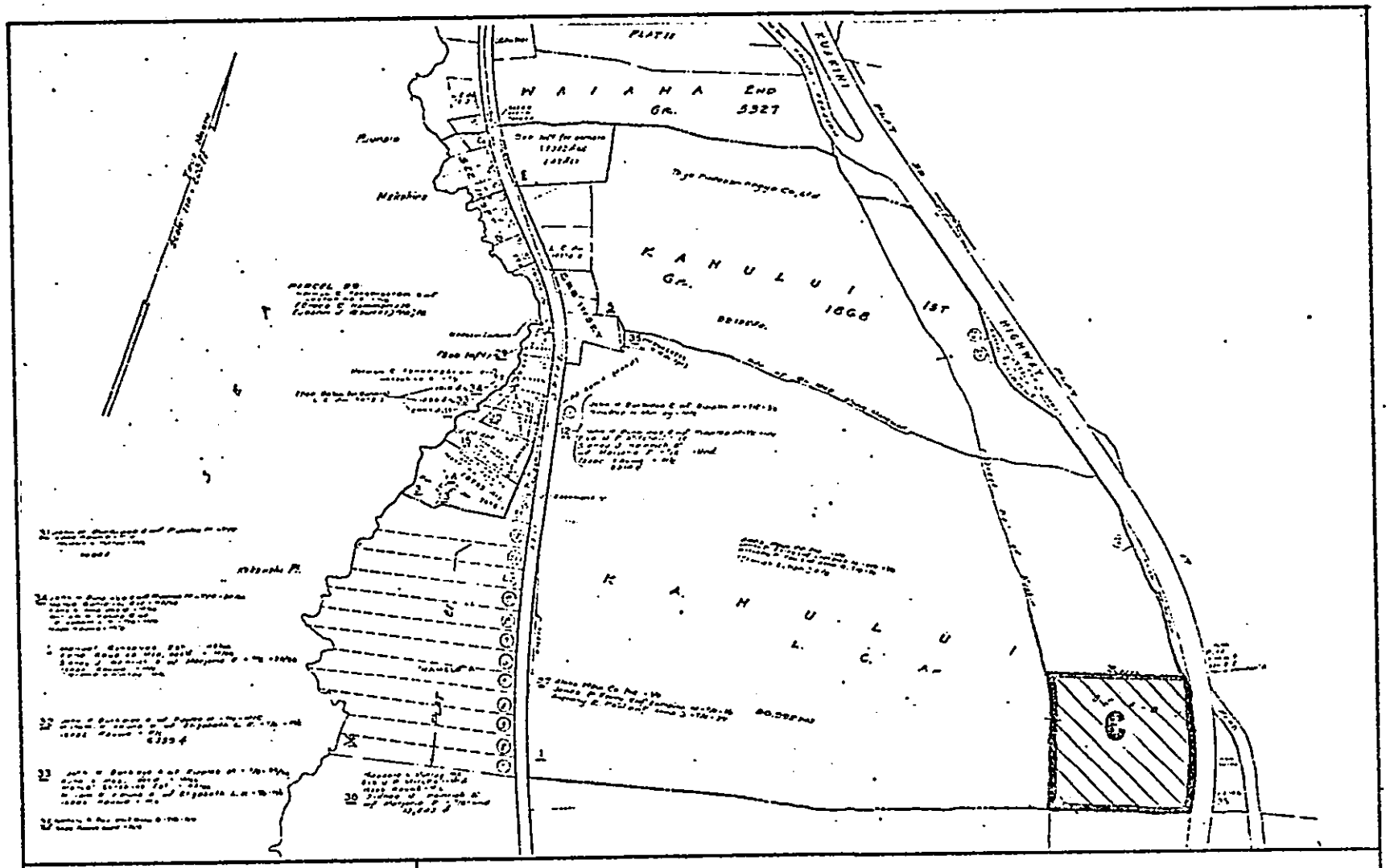


FIGURE 11	SITE C - TAX MAP KEY: 7-5-19:Por. 1
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

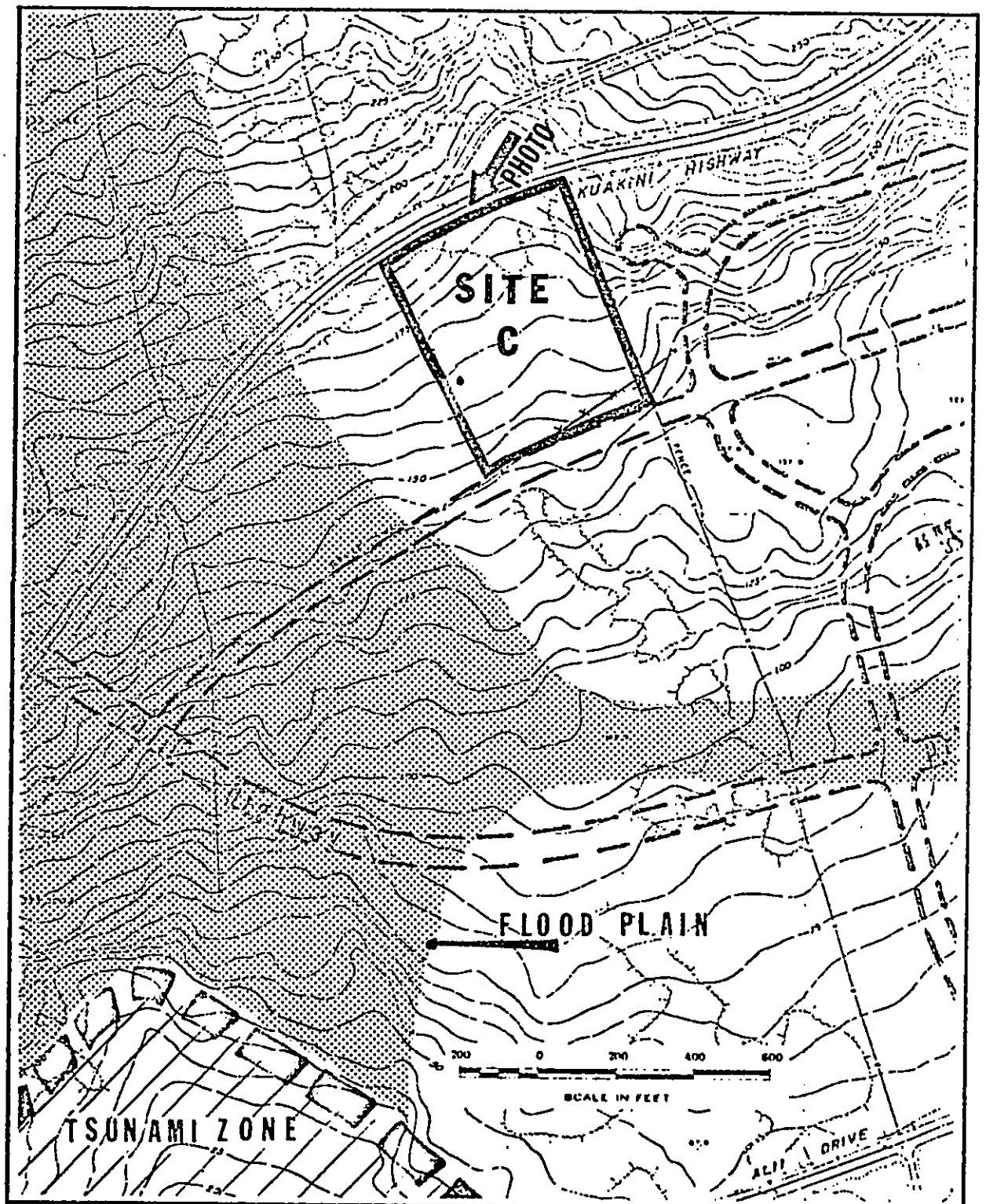
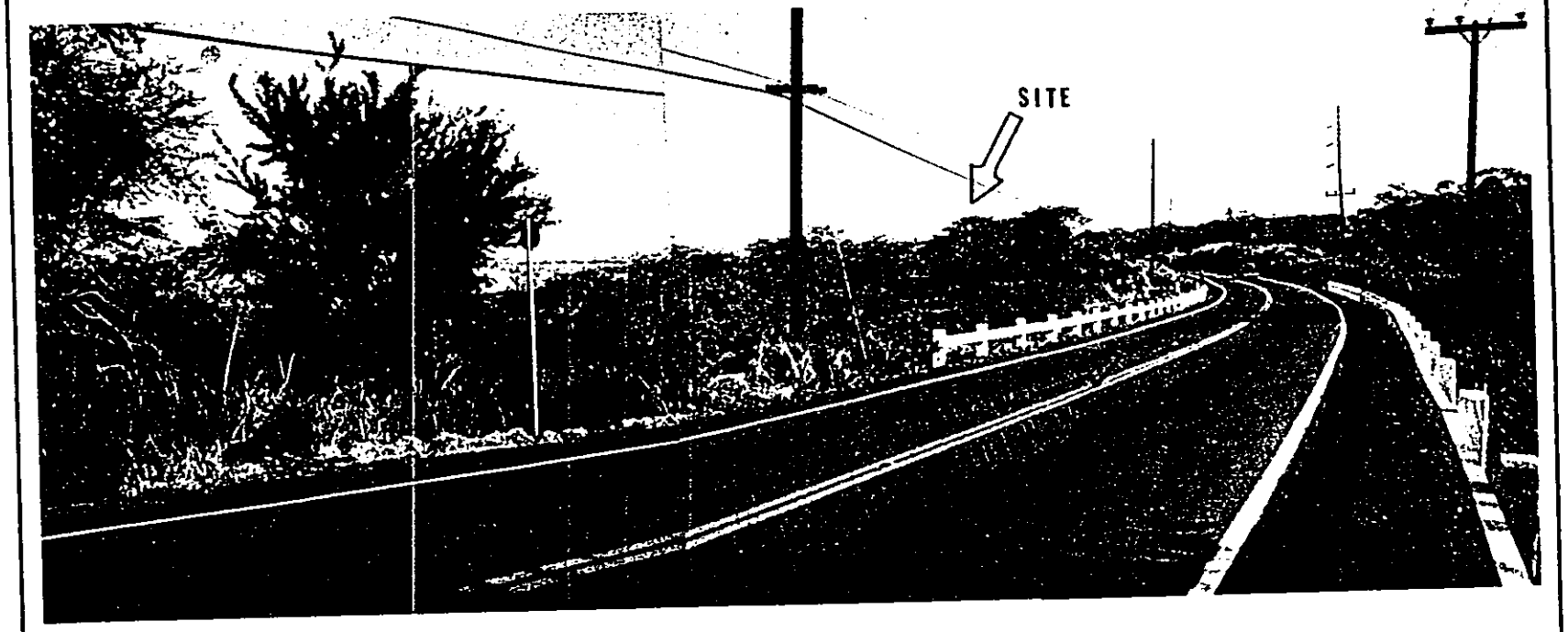


FIGURE 12	ALTERNATIVE SITE C

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS • PLANNING BRANCH



TMK: 7-5-19:01

FIGURE 13	PHOTOGRAPH OF ALTERNATIVE SITE C
STATE OF HAWAII • DIVISION OF PUBLIC WORKS	DEPT. OF ACCOUNTING & GENERAL SERVICES • PLANNING BRANCH

TABLE 5
ALTERNATIVE SITE D
DATA SHEET

Area: 7 acres of a 22.9-acre parcel.

SLU District: Urban

County: General Plan - Low Density
Zoning - RS-7.5

TMK: 7-6-13:portion 11 (Figure 14)

Owner: Kaelemakule/Akuna

Current Use: Vacant

Average Slope: 6% (Figure 15)

Access Road: Proposed Alii Highway.

Vegetation: Kiawe, haole koa, opiuma, grasses.

Photograph: (Figure 16)

Remarks: Access is dependent upon the completion of Alii Highway. The existing roadway right-of-way between the parcel and Alii Kai Subdivision is proposed for the widening of the Holualoa Drainage Channel. It will be necessary to provide an additional 50' access R.O.W. along the proposed drainage channel to avoid severance damages to the remainder of the 22.9-acre parcel.

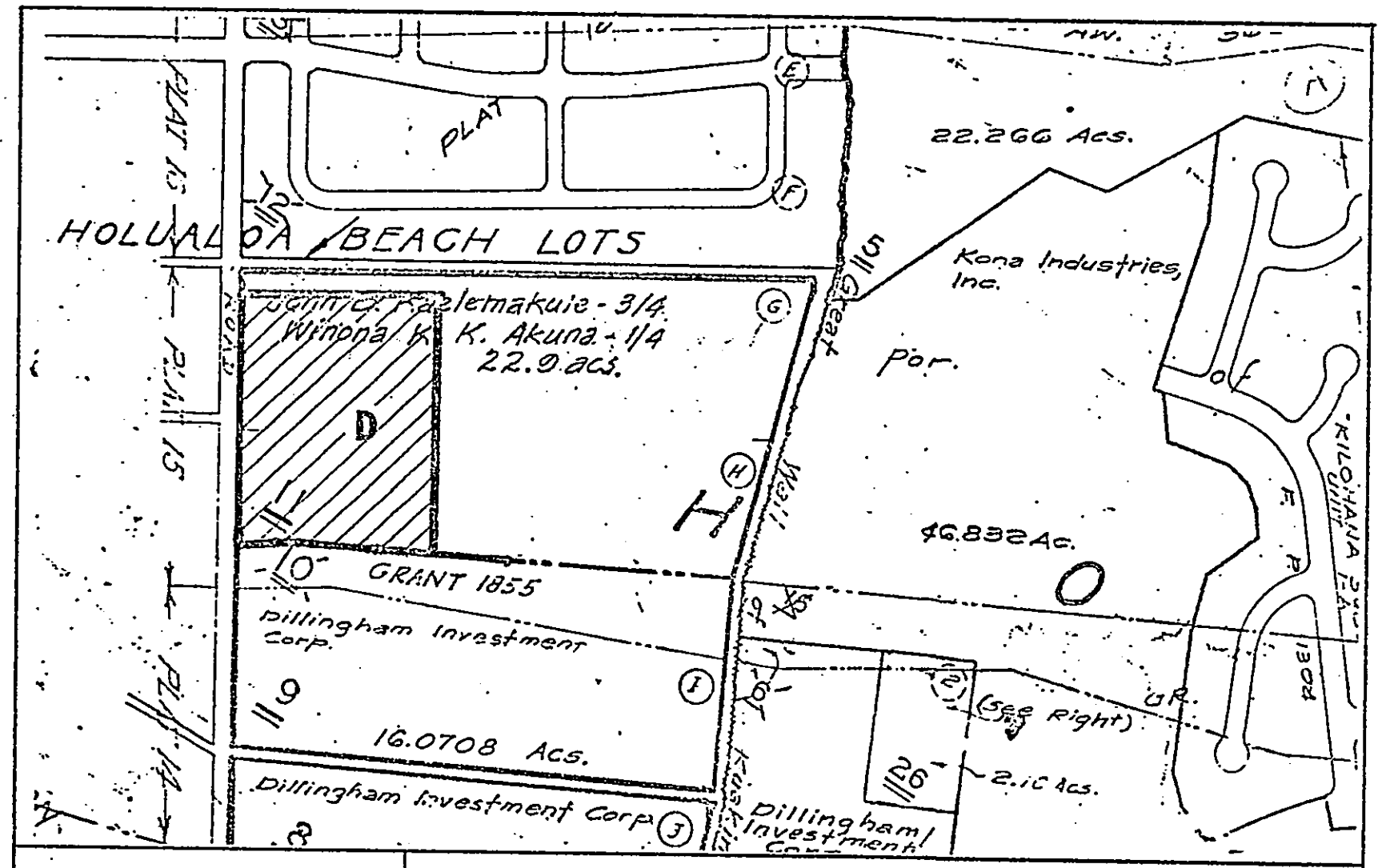


FIGURE 14	SITE D - TAX MAP KEY: 7-6-13:Por. 11
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

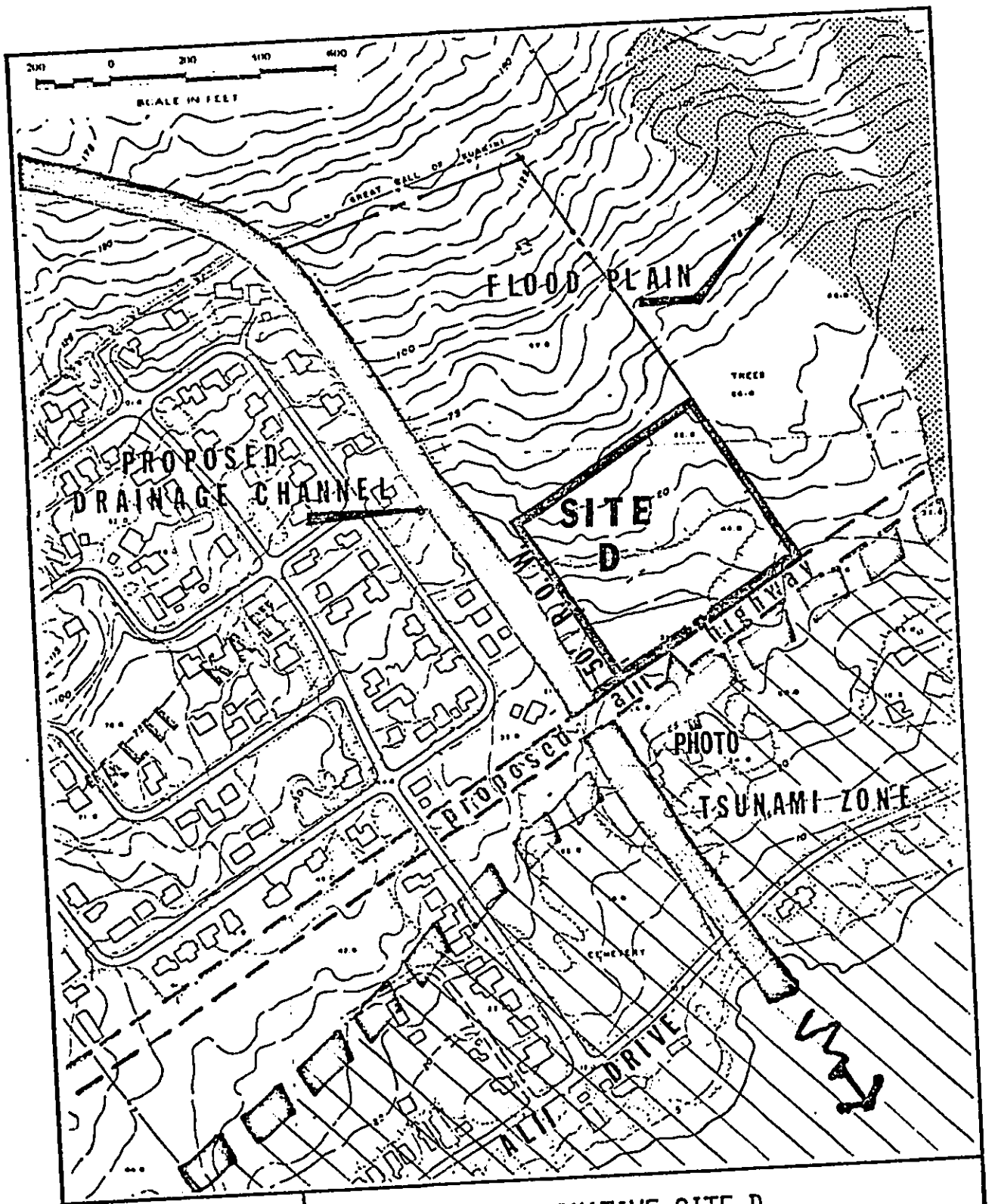
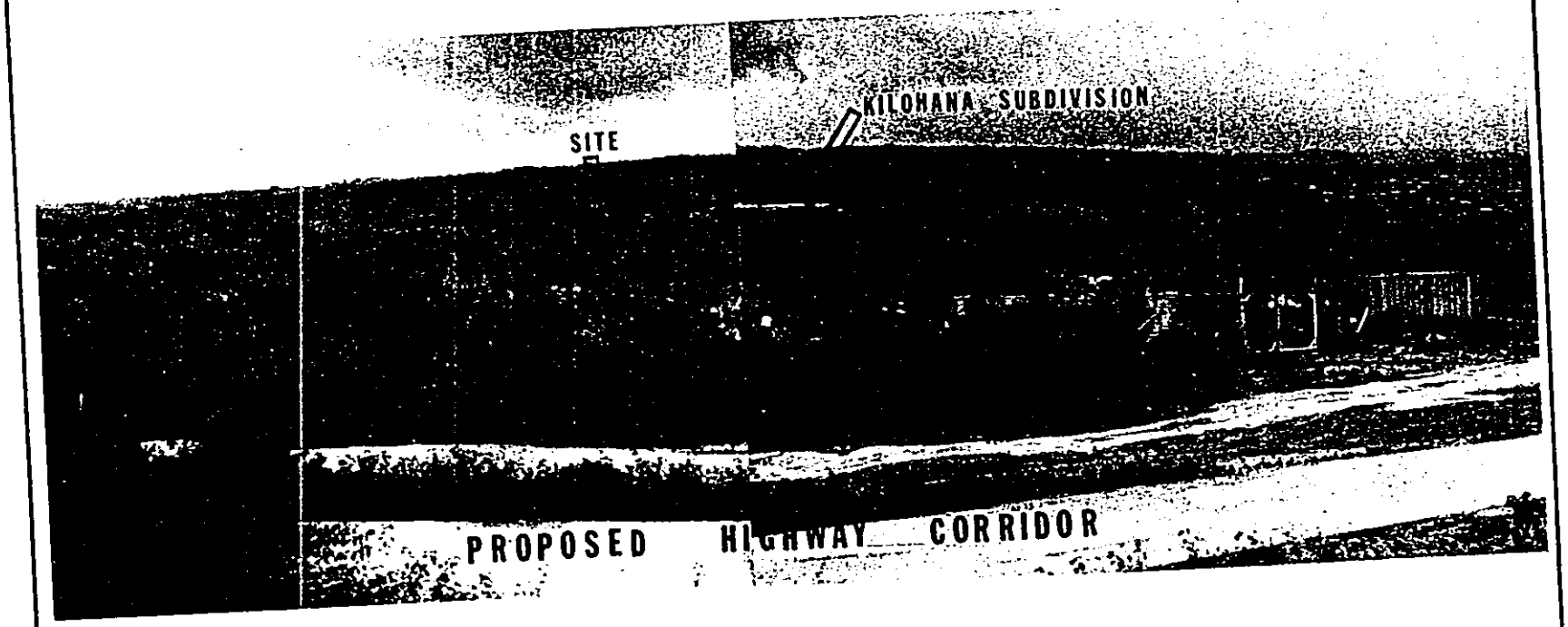


FIGURE 15 | ALTERNATIVE SITE D

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH



TMK: 7-6-13:11

FIGURE 16	PHOTOGRAPH OF ALTERNATIVE SITE D
STATE OF HAWAII • DIVISION OF PUBLIC WORKS	• DEPT. OF ACCOUNTING & GENERAL SERVICES • PLANNING BRANCH

TABLE 6
ALTERNATIVE SITE E
DATA SHEET

Area: 7 acres of a 16.0708-acre parcel.

SLU District: Agriculture

County: General Plan - Extensive Agriculture
Zoning - Unplanned and RS-7.5

TMK: 7-6-13:portion 09 (Figure 17)

Owner: Dillingham Investment Co.

Current Use: Vacant

Average Slope: 5% (Figure 18)

Access Road: Proposed Alii Highway.

Vegetation: Kiawe, haole koa, grasses.

Photograph: (Figure 19)

Remarks: Access is dependent upon the completion of Alii Highway. Since the site abuts a 30' roadway right-of-way along the south boundary, no severance damages are anticipated by acquiring the makai 7 acres of the 16±-acre parcel.

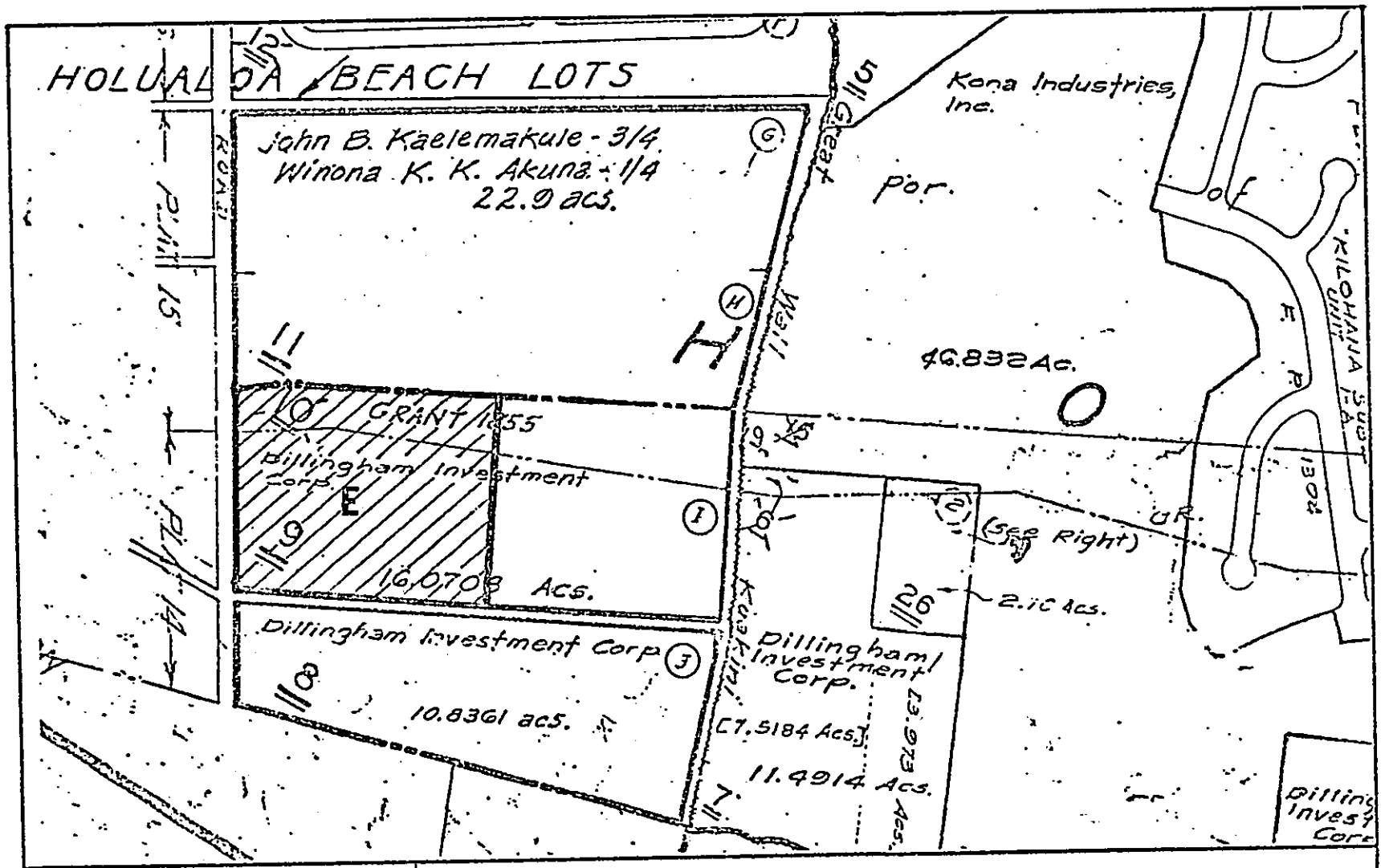


FIGURE 17	SITE E - TAX MAP KEY: 7-6-13:Por. 9
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

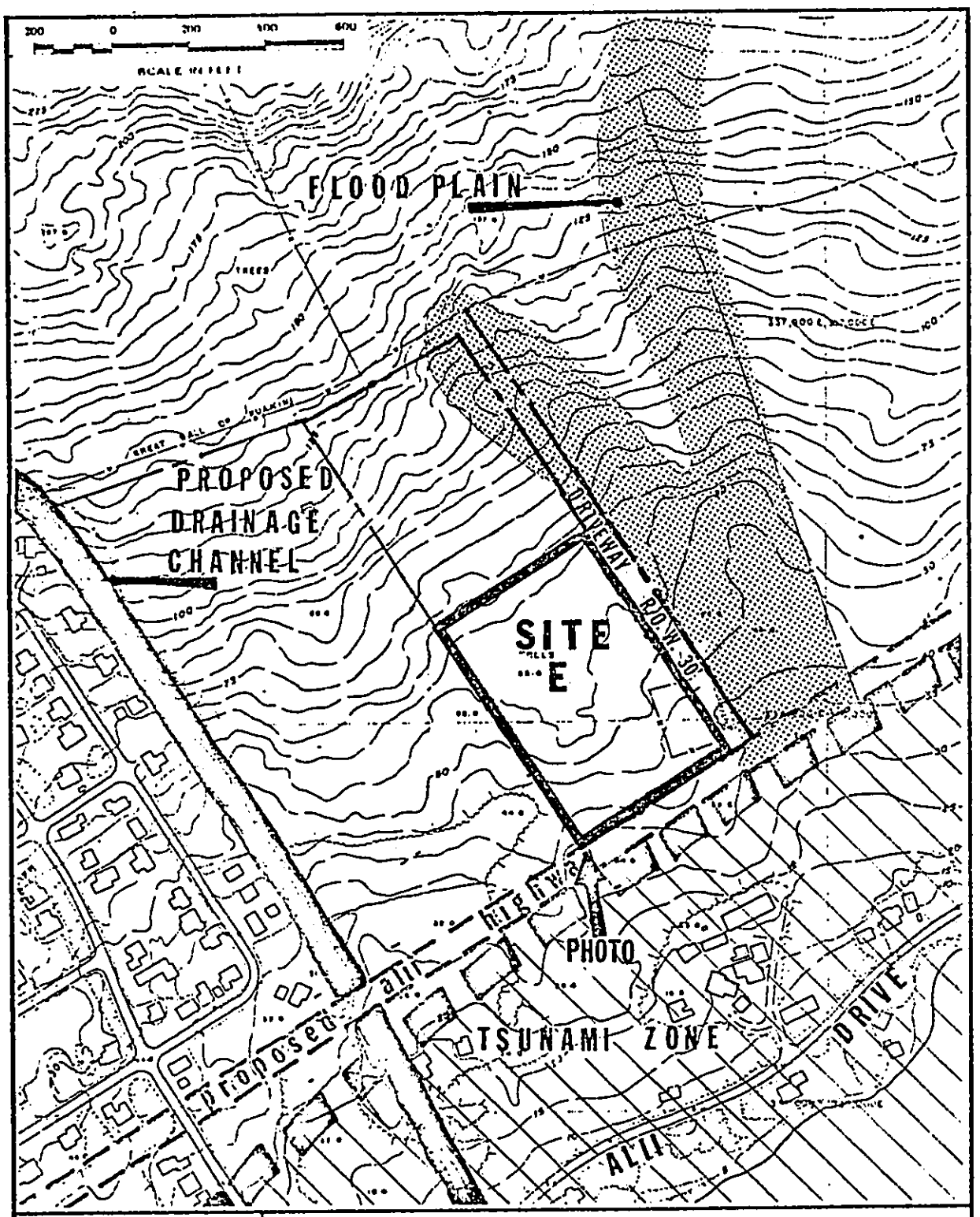
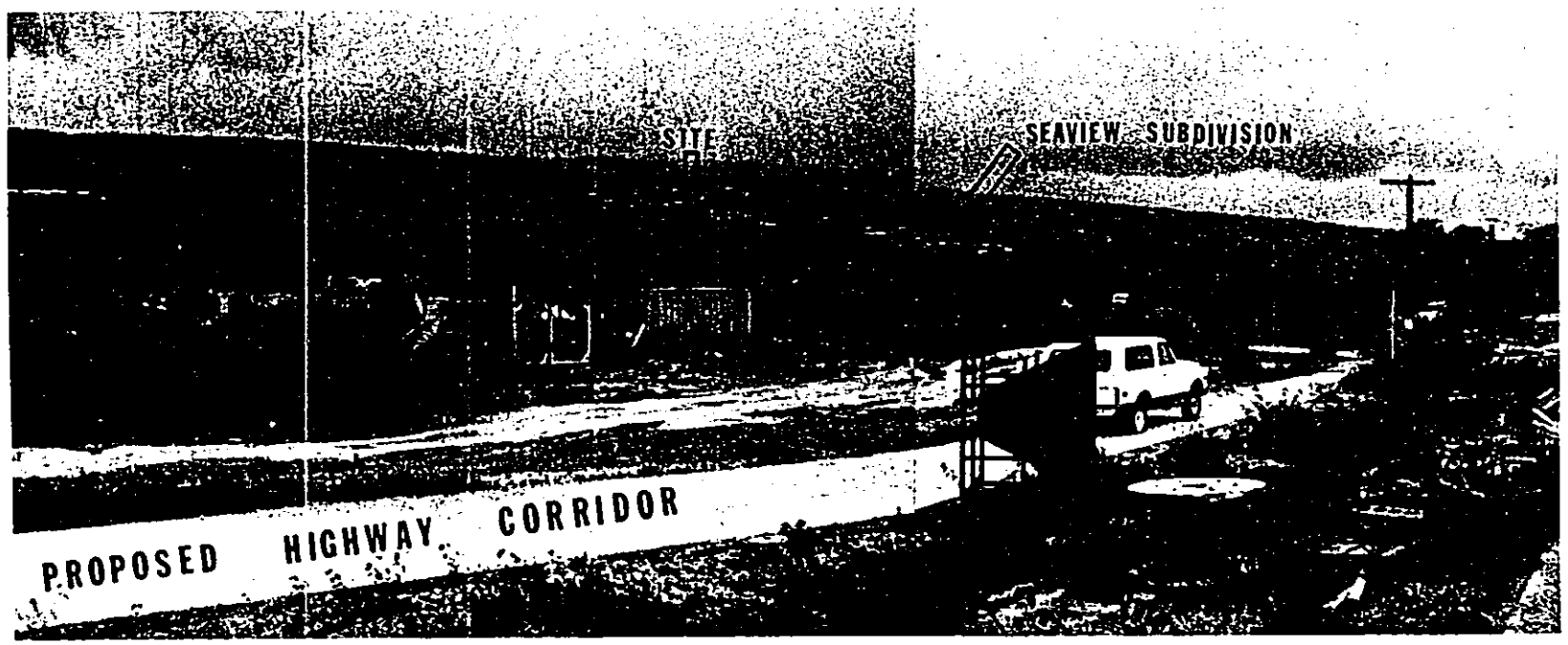


FIGURE 18	ALTERNATIVE SITE E

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH



TMK: 7-6-13:9

FIGURE 19	PHOTOGRAPH OF ALTERNATIVE SITE E

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

TABLE 7
ALTERNATIVE SITE F
DATA SHEET

Area: 7 acres of a 46.832-acre parcel.

SLU District: Urban

County: General Plan - Low Density
Zoning - RS-10

TMK: 7-6-13:portion 31 (Figure 20)

Owner: Kona Industries, Inc. (Bank of Hawaii)

Current Use: Vacant, undeveloped.

Average Slope: 8% (Figure 21)

Access Road: Existing 60-ft. R.O.W. subdivision road.

Vegetation: Kiawe, haole koa, grasses.

Photograph: (Figure 22)

Remarks: Uncertain plans for additional development of the subdivision may result in an undesirable dead end access roadway. The proposed site configuration would have to be revised if the subdivision is not developed beyond the existing increment. It is assumed that the existing subdivision roadway would have to be extended approximately 400 feet to provide better access to the site.

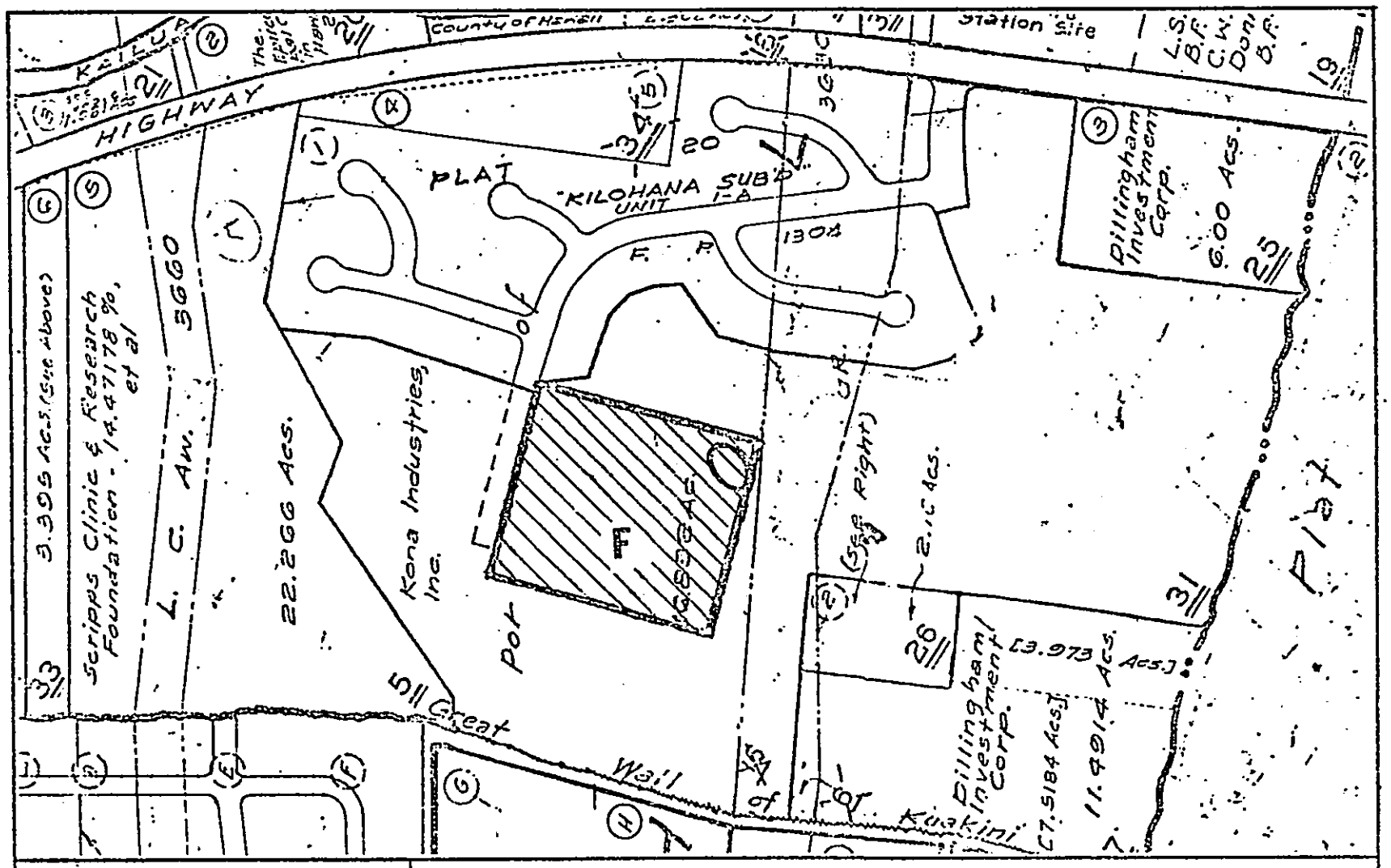


FIGURE 20	SITE F - TAX MAP KEY: 7-6-13:Por. 31
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

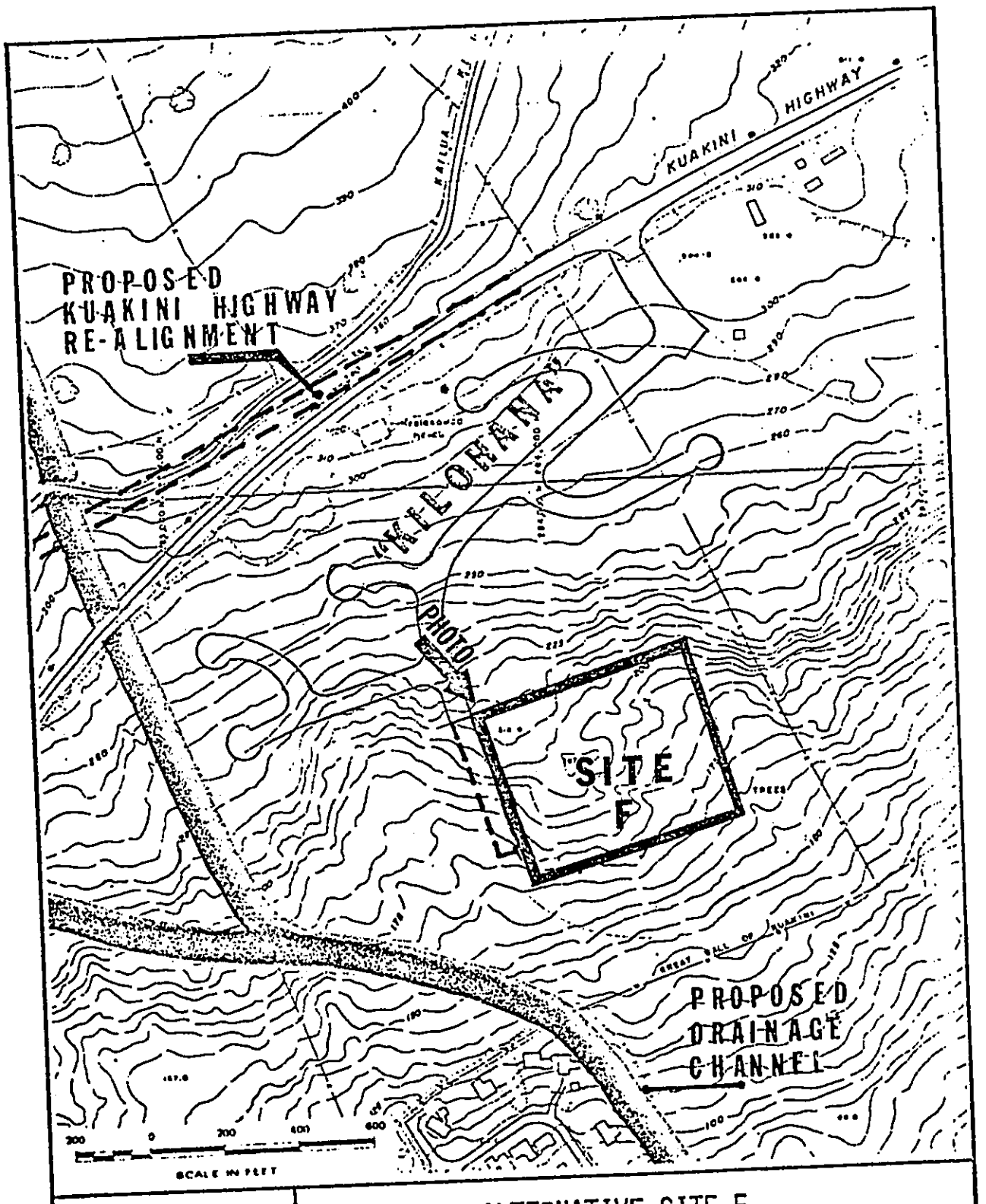
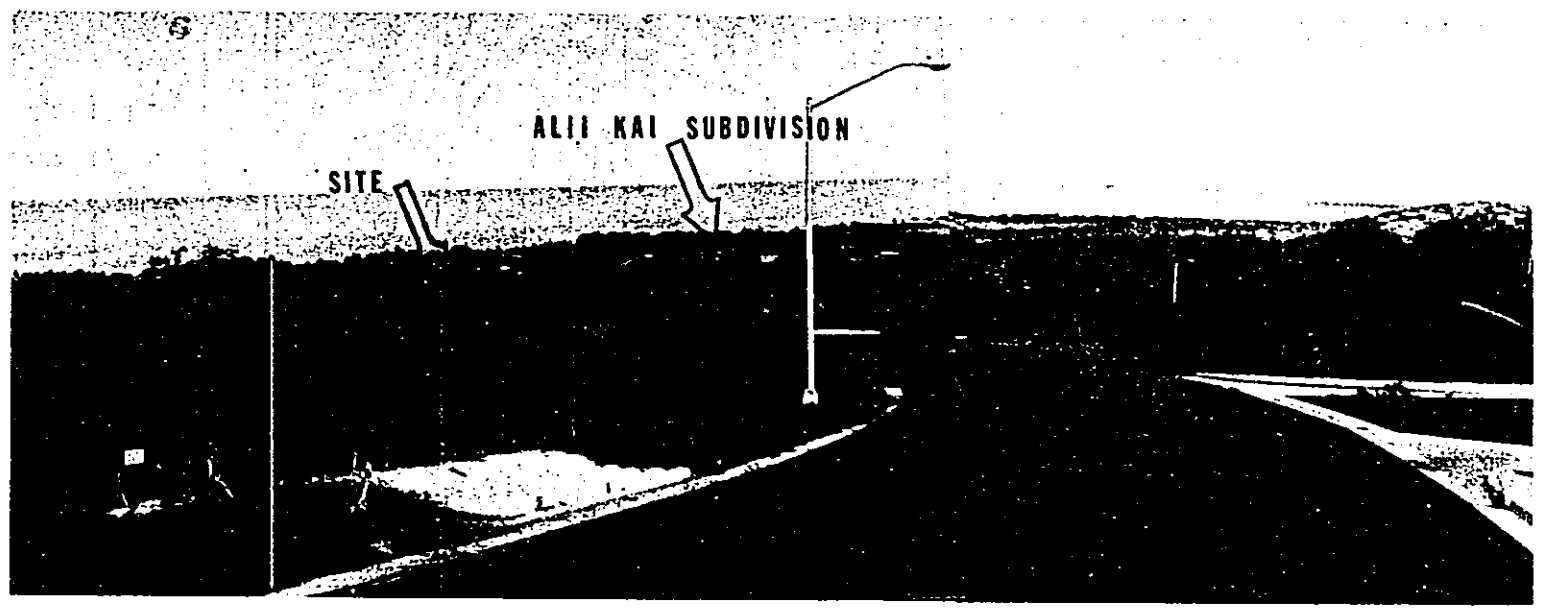


FIGURE 21	ALTERNATIVE SITE F
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH



TMK: 7-6-13:31

FIGURE 22	PHOTOGRAPH OF ALTERNATIVE SITE F
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

TABLE 8
ALTERNATIVE SITE G
DATA SHEET

Area: 7 acres of a 6.00 and 46.832-acre parcel.

SLU District: Urban

County: General Plan - Low Density
Zoning - RS-15

TMK: 7-6-13:25 and portion 31 (Figure 23)

Owner: Dillingham Investment Corp. and Kona Industries, Inc. (Bank of Hawaii)

Current Use: Vacant/Residence/Warehouse

Average Slope: 7% (Figure 24)

Access Road: Kuakini Highway and existing 80-ft. R.O.W. subdivision roadway.

Vegetation: Kiawe, haole koa, opiuma, grasses.

Photograph: (Figure 25)

Remarks: Acquisition of this site will require relocation of displacees. Highway noise and traffic hazards will also be negative factors since the Kuakini Highway is projected for upgrading to a major highway along the site.

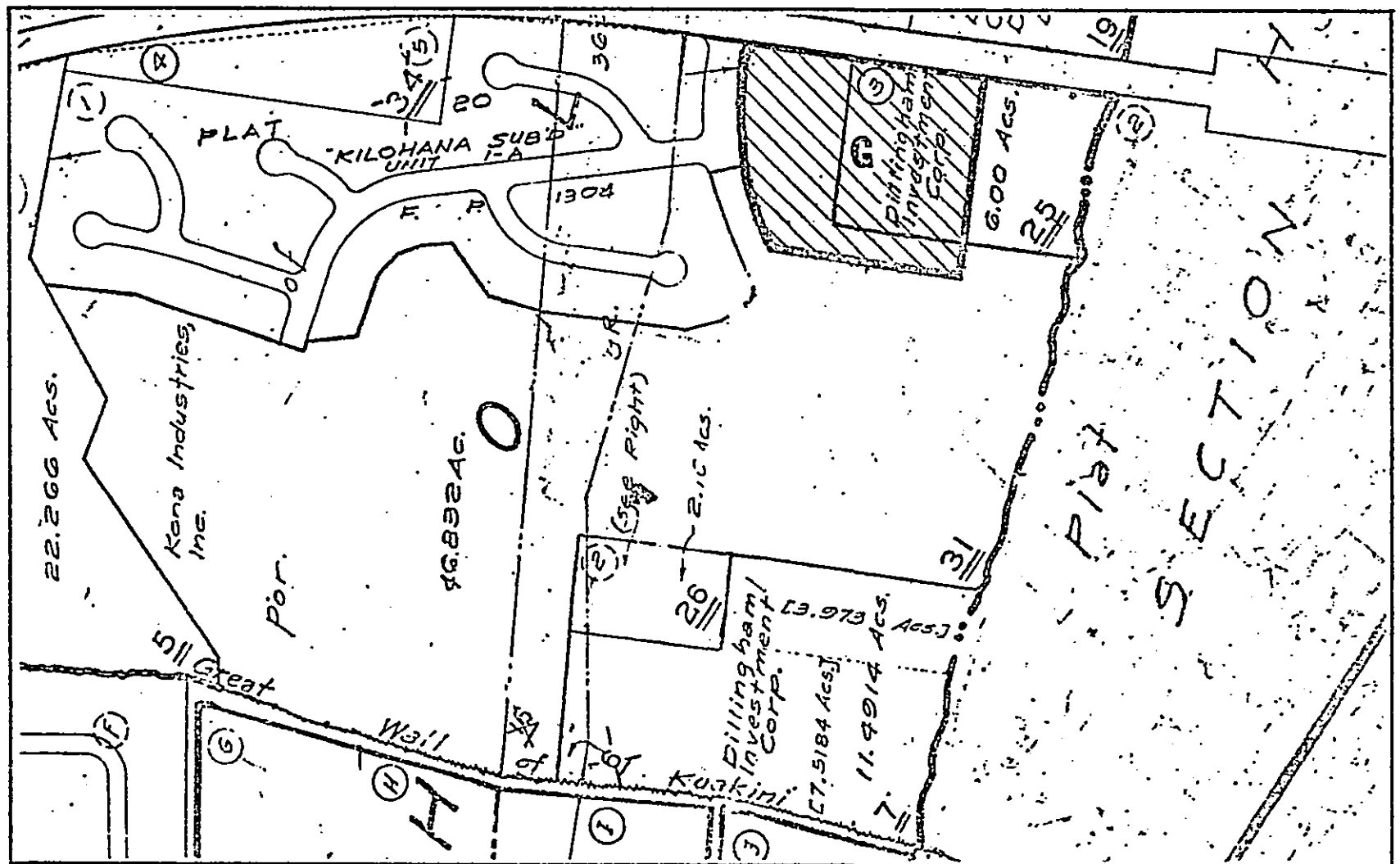


FIGURE 23	SITE G - TAX MAP KEY: 7-6-13:25 & POR. 31
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

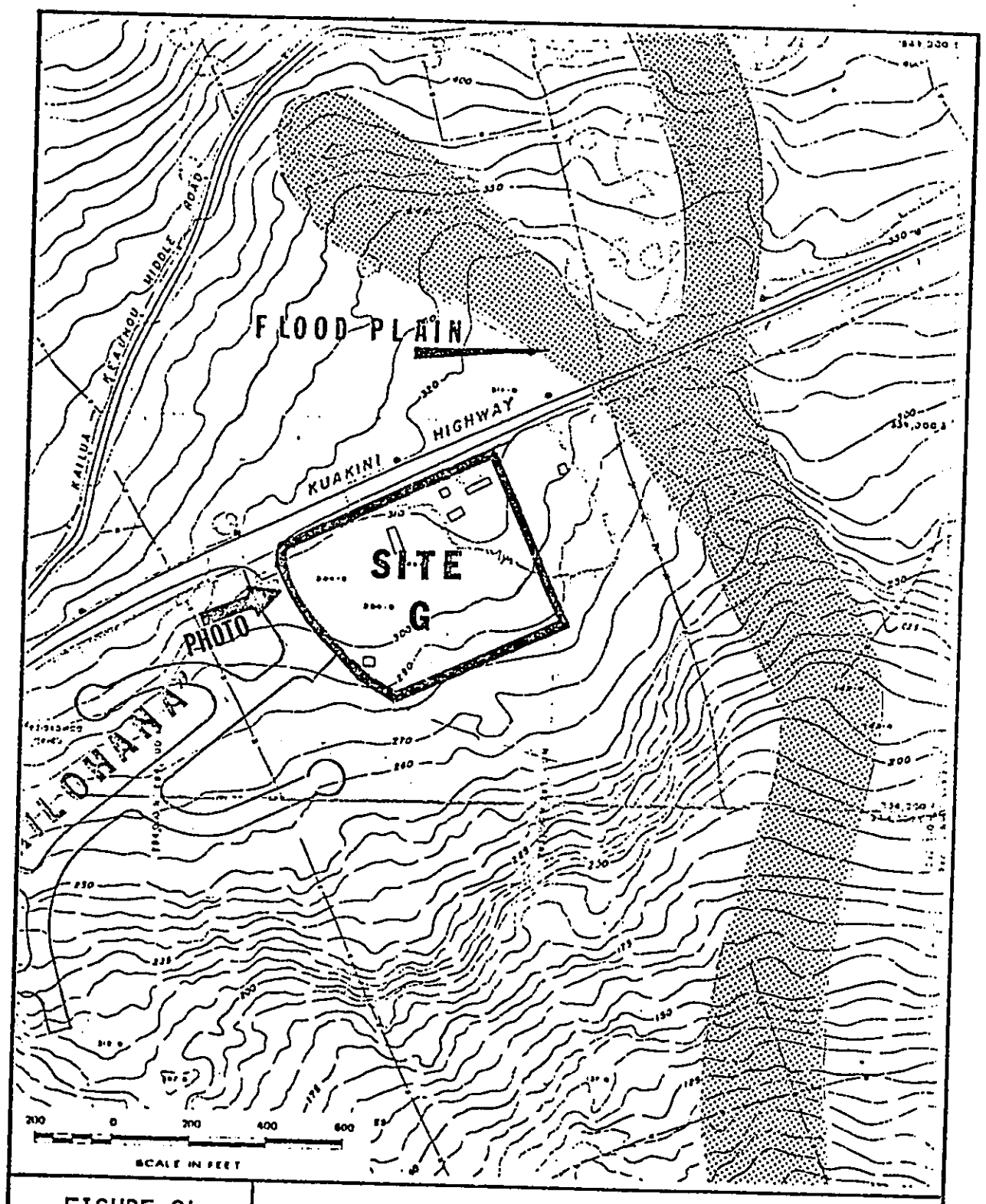
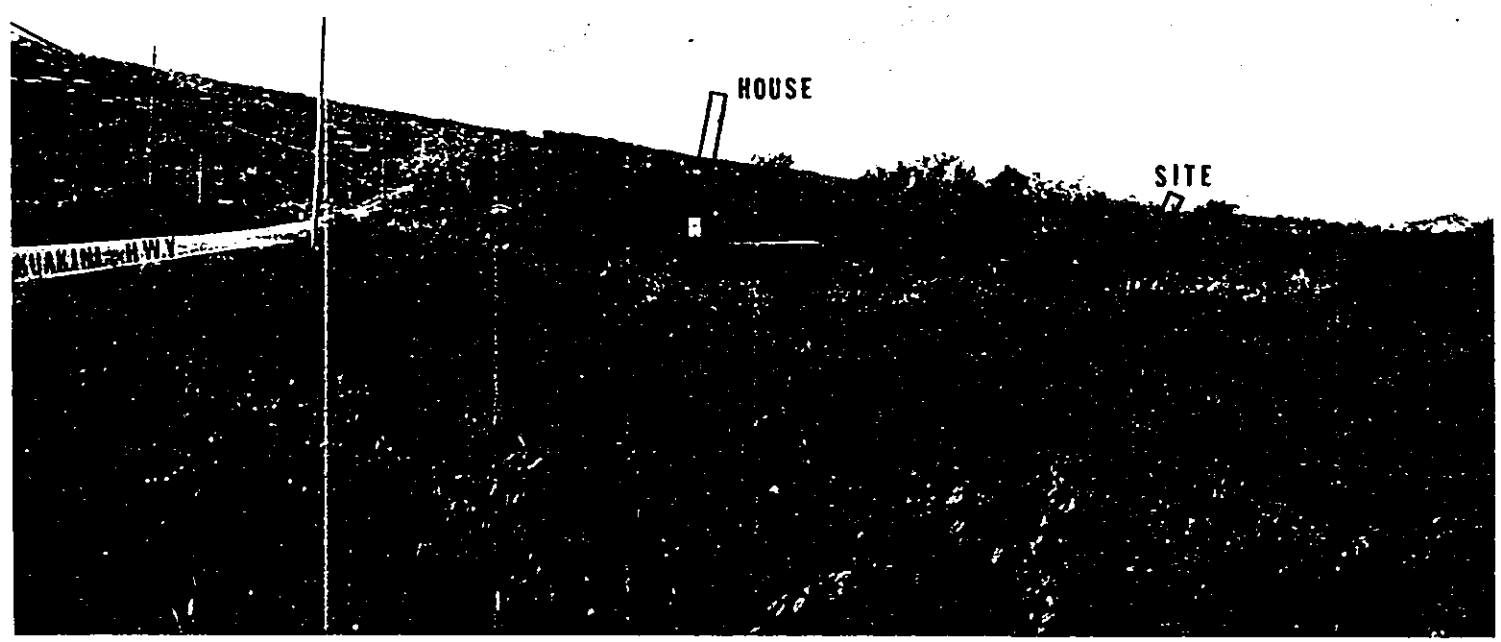


FIGURE 24	ALTERNATIVE SITE G
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH



TMK: 7-6-13:25 & 31

FIGURE 25	PHOTOGRAPH OF ALTERNATIVE SITE G
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

TABLE 9
ALTERNATIVE SITE H
DATA SHEET

Area: 7 acres of a 24.470-acre parcel.

SLU District: Urban

County: General Plan - Medium Density
Zoning - RM-2

TMK: 7-8-10:portion 52 (Figure 26)

Owner: B. P. Bishop Estate

Current Use: Vacant

Average Slope: 8% (Figure 27)

Access Road: Existing Alii Drive.

Vegetation: Haole koa, grasses.

Photograph: (Figure 28)

Remarks: This site is surrounded by the Keauhou Golf Course. The site is also removed from most of the existing and proposed residential developments.

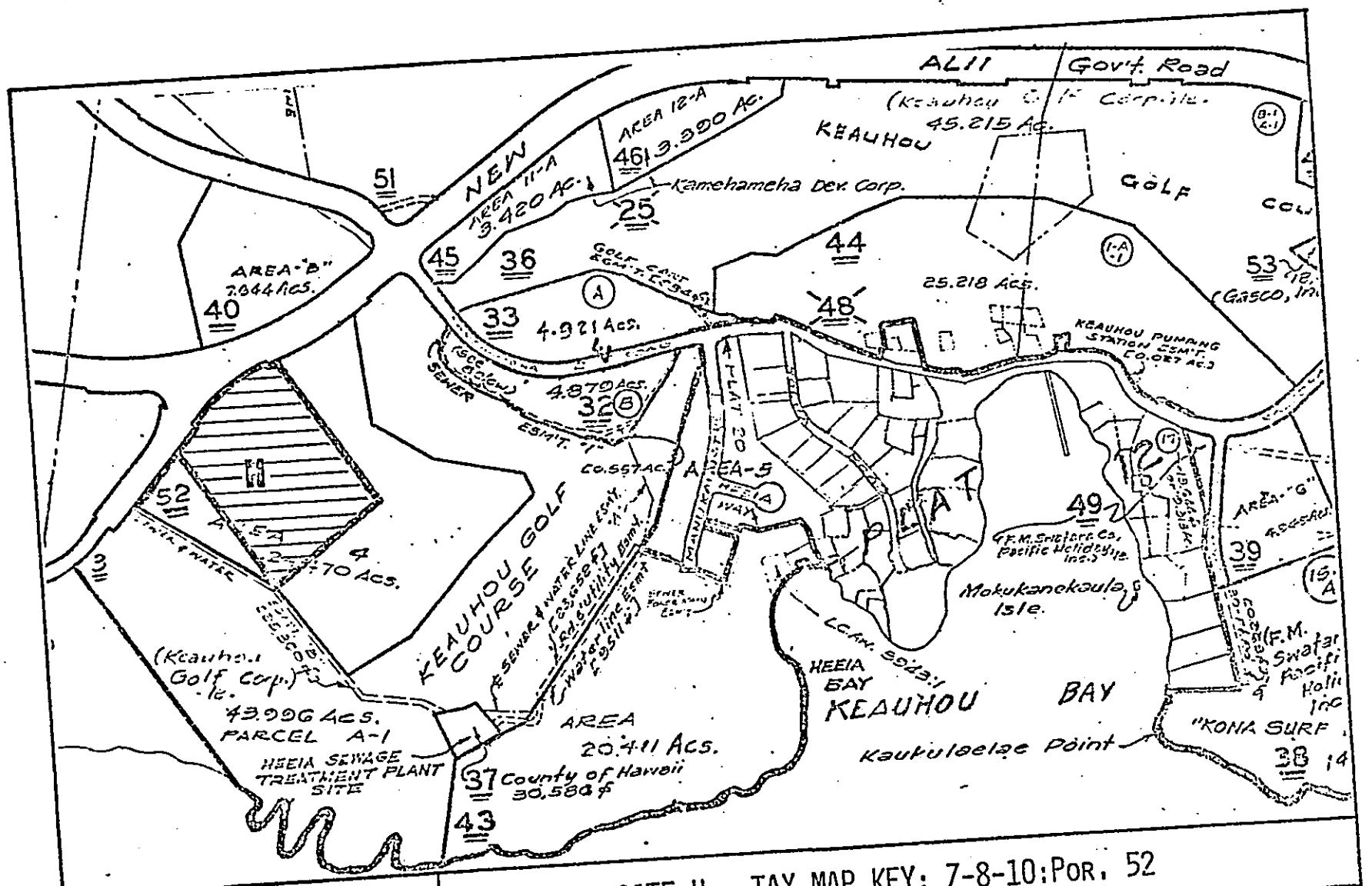


FIGURE 26

SITE H - TAX MAP KEY: 7-8-10:POR. 52

STATE OF HAWAII
DIVISION OF PUBLIC WORKS

DEPT. OF ACCOUNTING & GENERAL SERVICES
PLANNING BRANCH

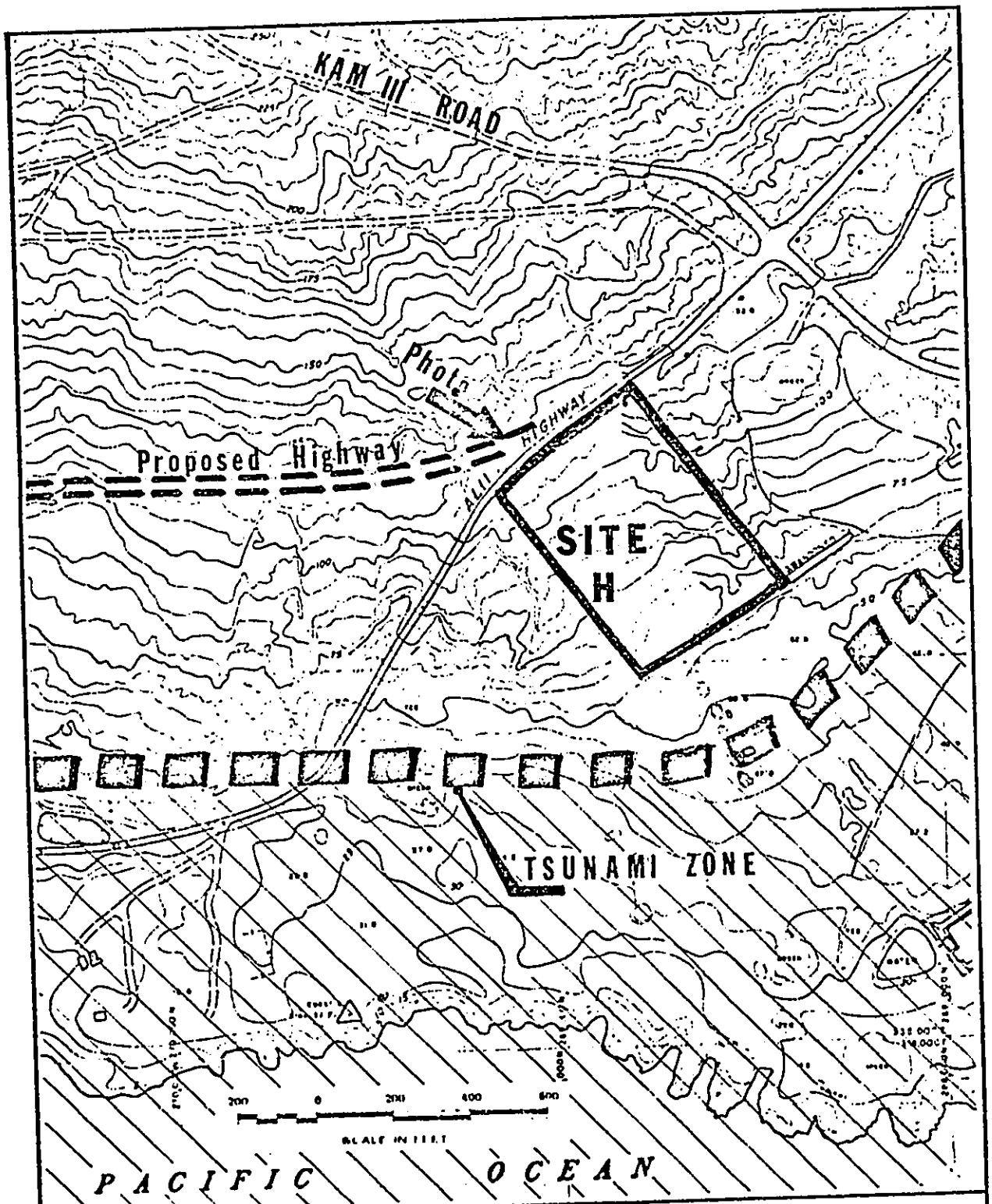
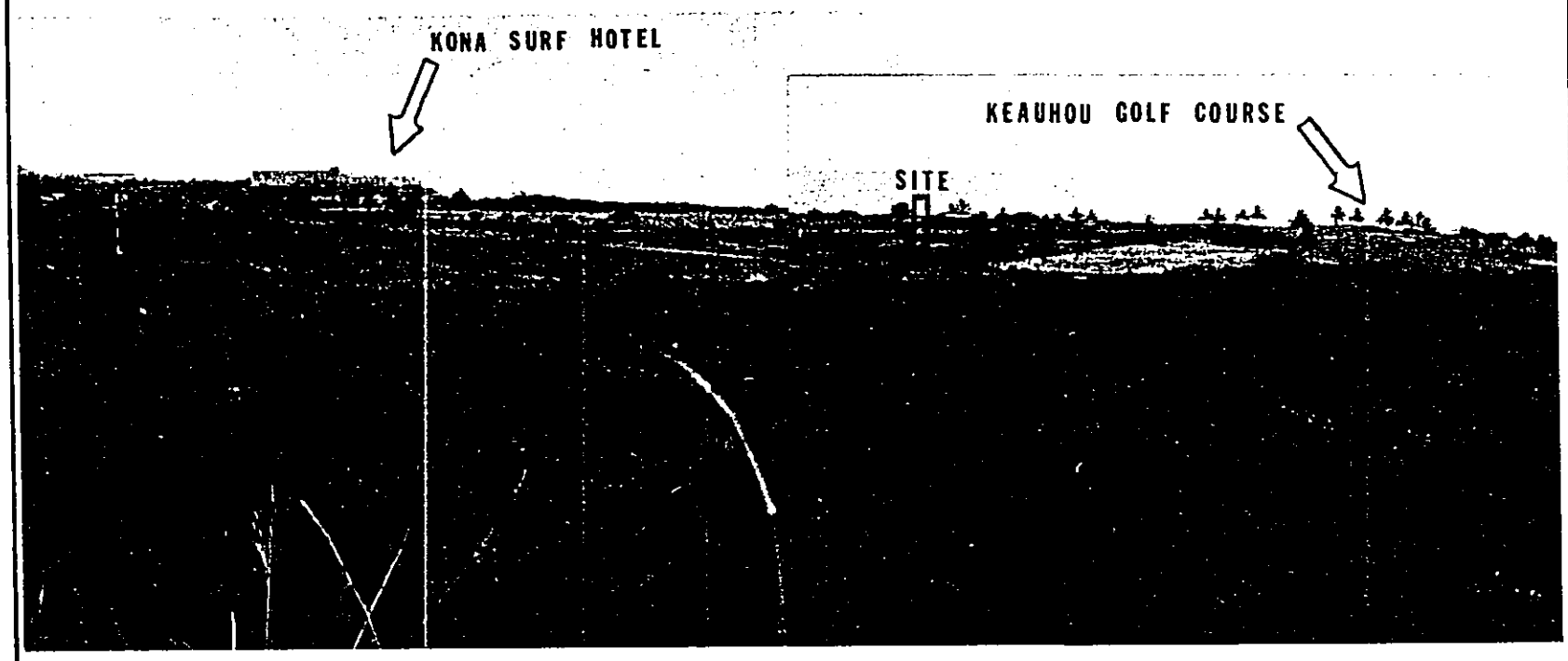


FIGURE 27	ALTERNATIVE SITE H
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH



TMK: 7-8-10:52

FIGURE 28	PHOTOGRAPH OF ALTERNATIVE SITE H
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

TABLE 10
ALTERNATIVE SITE 1
DATA SHEET

Area: 7 acres of a 80.992-acre parcel.

SLU District: Urban

County: General Plan - Resort
Zoning - Unplanned

TMK: 7-5-19:portion 01 (Figure 29)

Owner: Chiaki Matsuo (A/S)

Current Use: Grazing

Average Slope: 4% (Figure 30)

Access Road: Existing Alii Drive.

Vegetation: Kiawe, haole koa, opiuma, grasses.

Photograph: (Figure 31)

Remarks: This site was selected as an alternate to Site B and to avoid conflict with the proposed development plans.

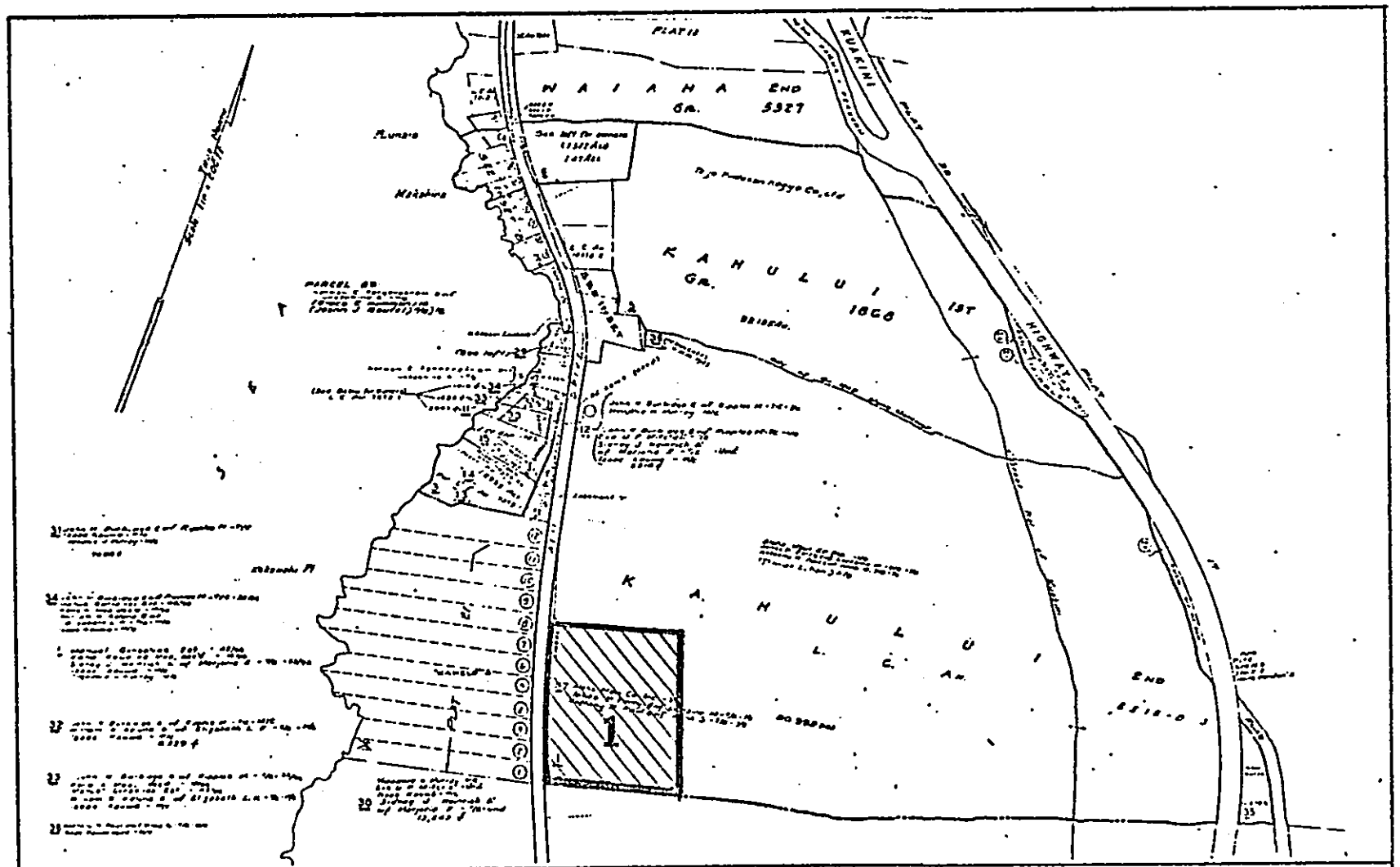


FIGURE 29	SITE 1 - TAX MAP KEY: 7-5-19:POR. 1
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

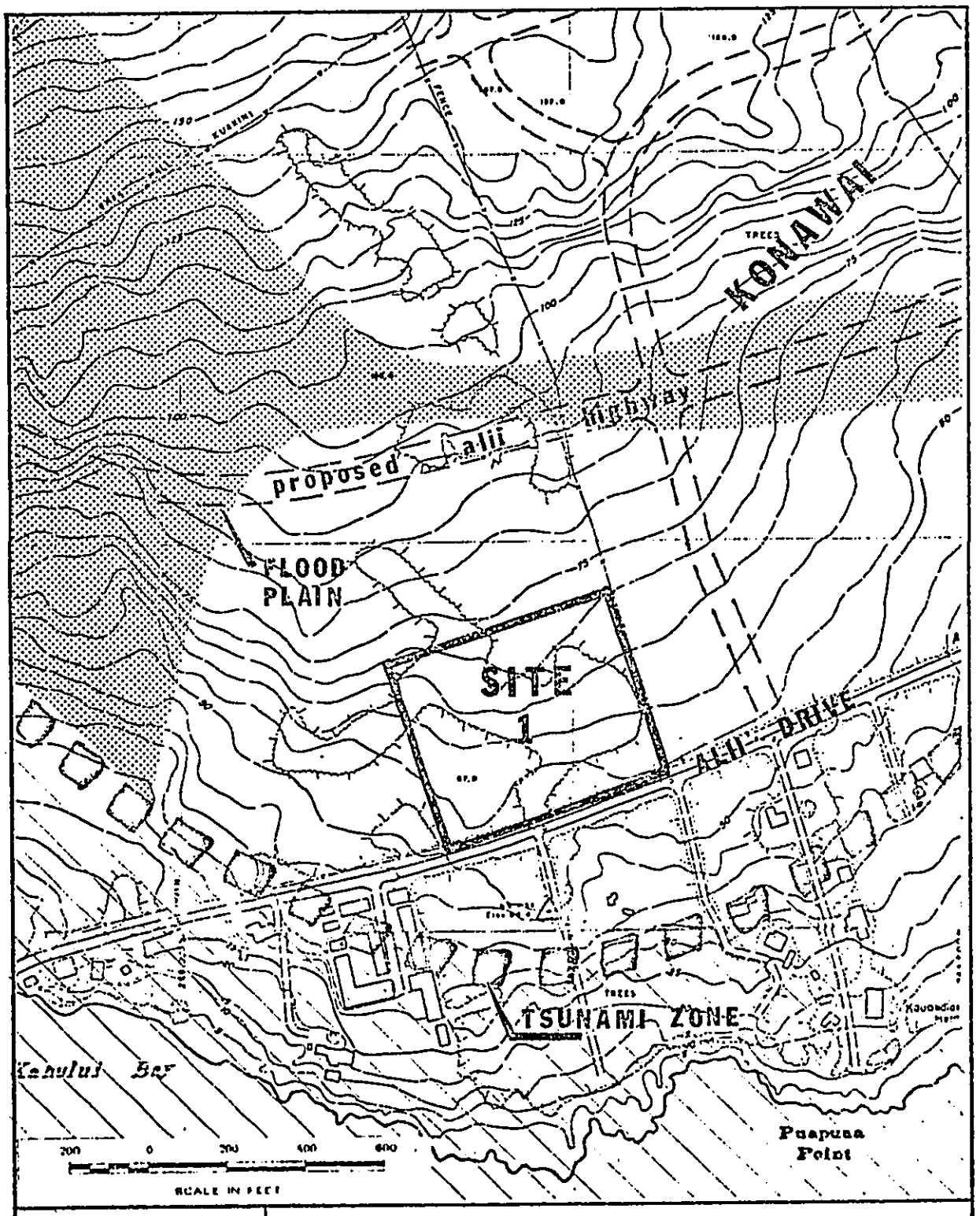


FIGURE 30	ALTERNATIVE SITE 1
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH

TMK: 7-5-20:Por. 1

FIGURE 31	PHOTOGRAPH OF ALTERNATIVE SITE 1

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

TABLE 11
ALTERNATIVE SITE 2
DATA SHEET

Area: 7 acres of a 232.842-acre parcel.

SLU District: Urban

County: General Plan - Low Density
Zoning - RS-7.5

TMK: 7-8-10:portion 04 (Figure 32)

Owner: B. P. Bishop Estate

Current Use: Vacant

Average Slope: 8% (Figure 33)

Access Road: Proposed Kamehameha Development roadways and proposed Alii Highway.

Vegetation: Kiawe, haole koa, grases.

Photograph: (Figure 34)

Remarks: This site was suggested by the landowner as an alternate to Site H.

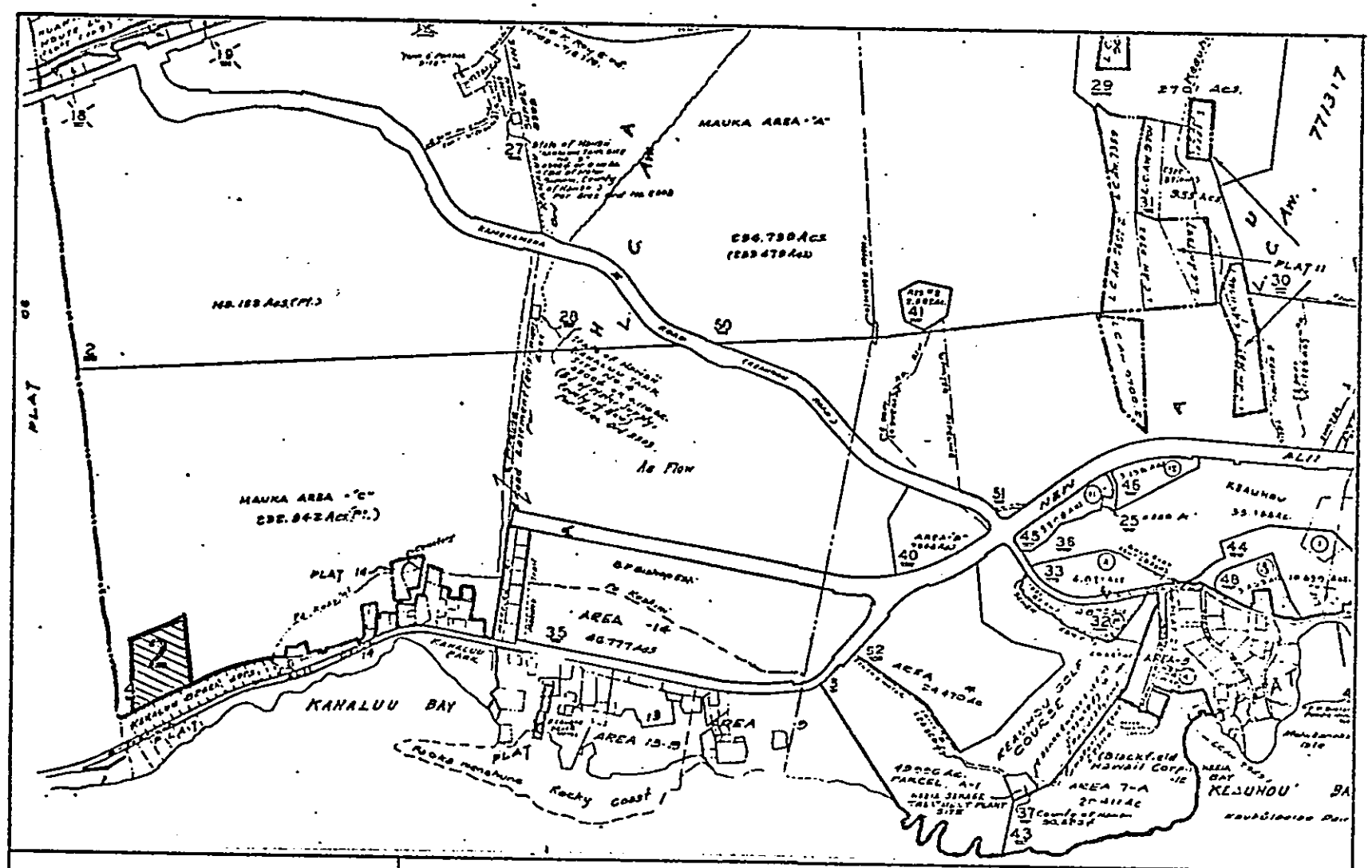


FIGURE 32	SITE 2 - TAX MAP KEY: 7-8-10:Por. 4
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

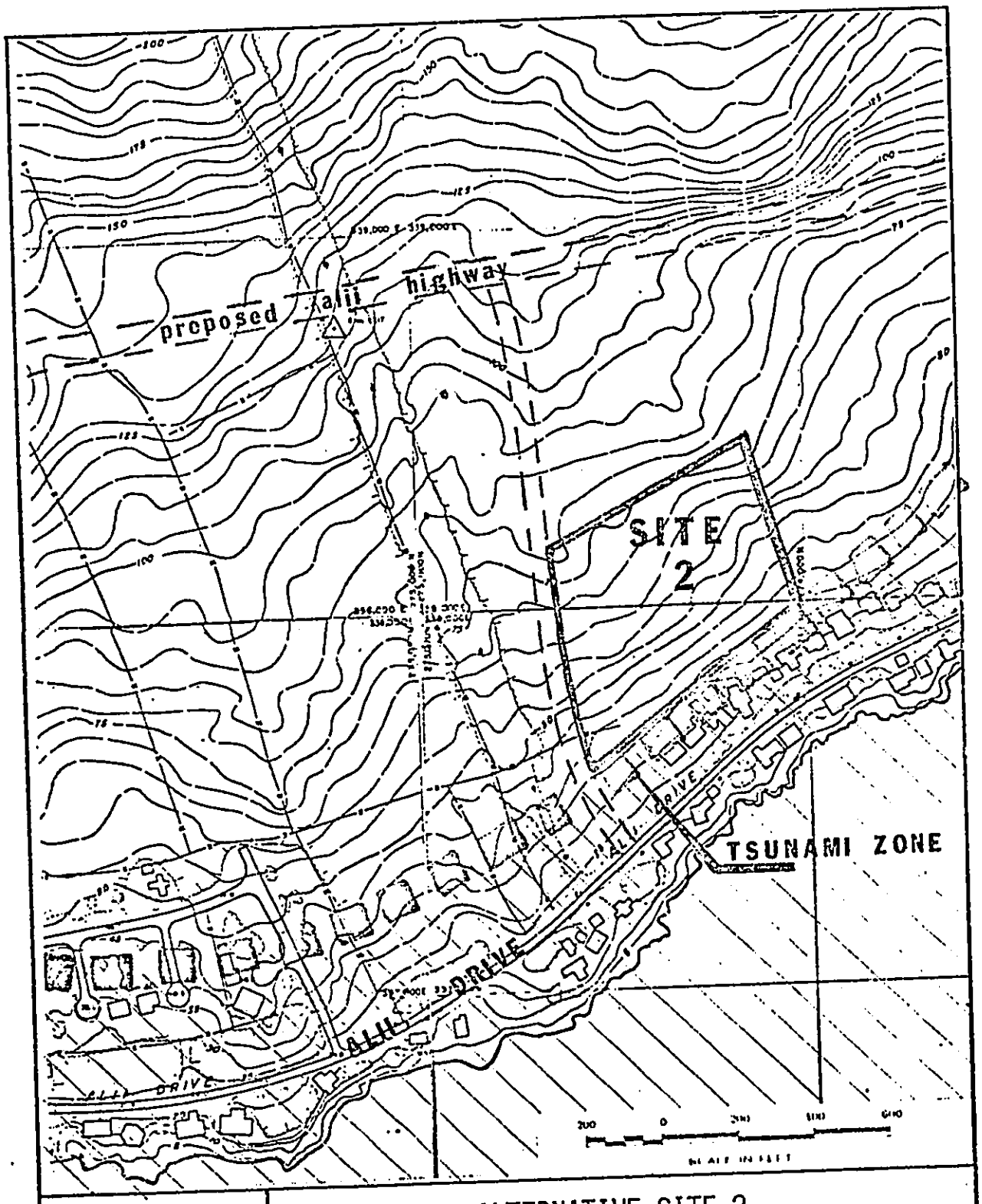
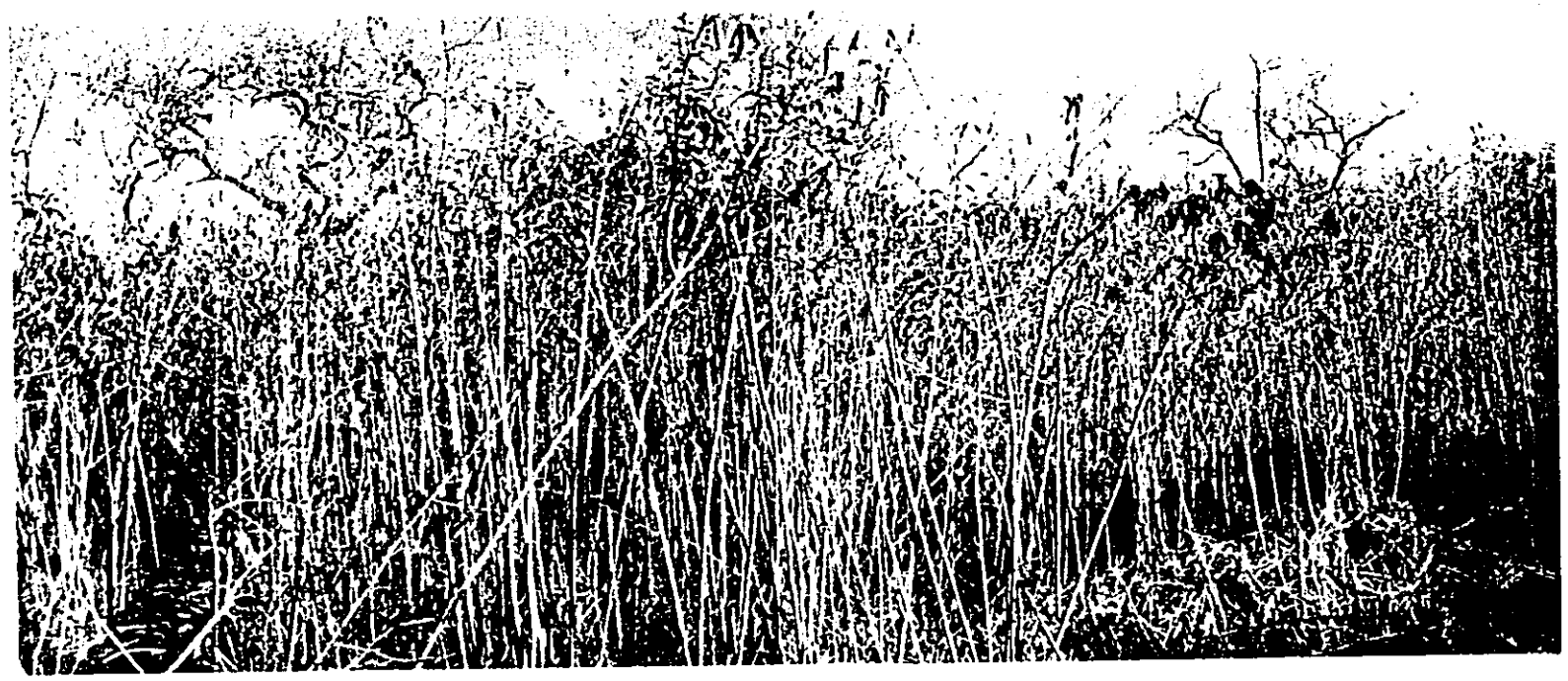


FIGURE 33	ALTERNATIVE SITE 2
STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES	
DIVISION OF PUBLIC WORKS • PLANNING BRANCH	



TMK: 7-8-10:Por. 4

FIGURE 34	PHOTOGRAPH OF ALTERNATIVE SITE 2
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

CHAPTER 3
DATA ON ALTERNATIVE SITES

STATE LAND USE

The State Land Use District Map covering the school service area is shown in Figure 35. It includes portions of the Kailua Quadrangle Map H-7 and Kealakekua Quadrangle Map H-8. The district symbols used on State Land Use District Maps are as follows:

C - Conservation District
A - Agricultural District
R - Rural District
U - Urban District

All of the alternative sites are within the Urban District, except Alternative Site E which is located in the Agriculture District. Since schools may be developed only on Urban zoned lands, the selection of Site E will require an amendment to the State Land Use District Map.

COUNTY GENERAL PLAN

A portion of the Hawaii County General Plan for the South Kona District is shown in Figure 36. The map shows the designation for all of the alternative sites except Sites H and 2 which are outside the limits of this map. The alternative sites and their respective designations are shown in Table 12.

TABLE 12
COUNTY GENERAL PLAN DESIGNATION

Site	Designation
A	Alternate Urban
B	Resort
C	Alternate Urban
D	Low Density
E	Extensive Agriculture
F	Low Density
G	Low Density
H	Medium Density
1	Resort
2	Low Density

Based upon the above designations, a school can be developed on Alternative Sites D, F, G, H, and 2 with no change in designation. Alternative Sites A, B, C, E, and 1 can also be developed for school use with the approval of the County.

COUNTY ZONING

Figure 37 provides the Hawaii County zoning designation for each alternative site. The alternative sites and their respective zonings are shown in Table 13.

TABLE 13
COUNTY ZONING

Site	Zoning
A	Unplanned
B	Unplanned
C	Unplanned
D	RS-7.5 and Unplanned
E	Unplanned
F	RS-10, RS-15
G	RS-15
H	RM-2
1	Unplanned
2	RS-7.5

Under the Hawaii County's zoning regulations, schools are permitted in residential zones on lots one (1) acre or more. Schools are also permitted in unplanned zones on lots five (5) acres or more.

FLOOD AND TSUNAMI

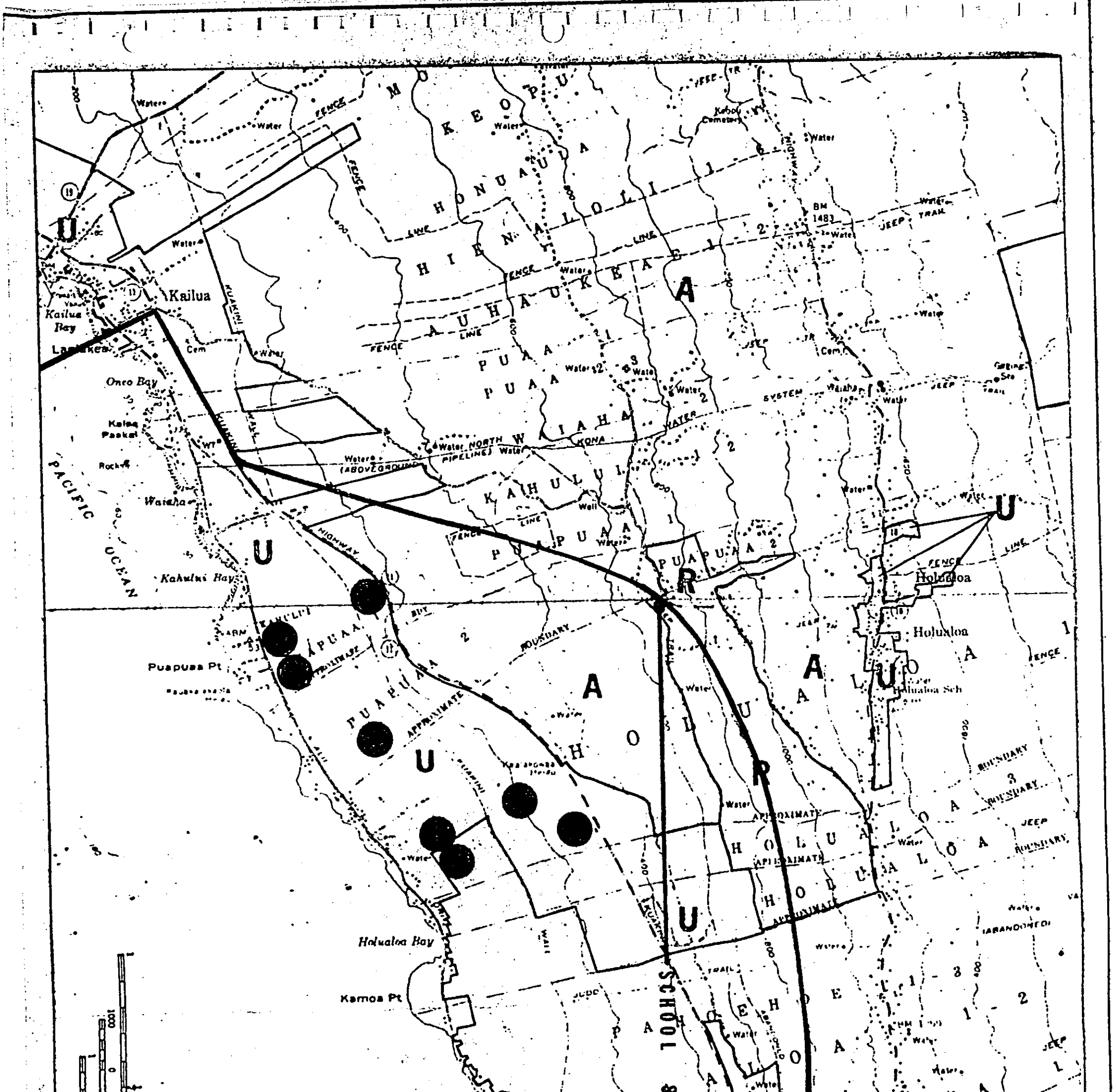
Figure 38 shows the potential areas subject to flooding and tsunami inundation within the school service area. The map was prepared by the U.S. Geological Survey and incorporates data from the Hawaii Institute of Geophysics Tsunami Research Program. As shown on the map, the alternative sites are all outside the potential flood and tsunami inundation areas.

HISTORICAL SITES

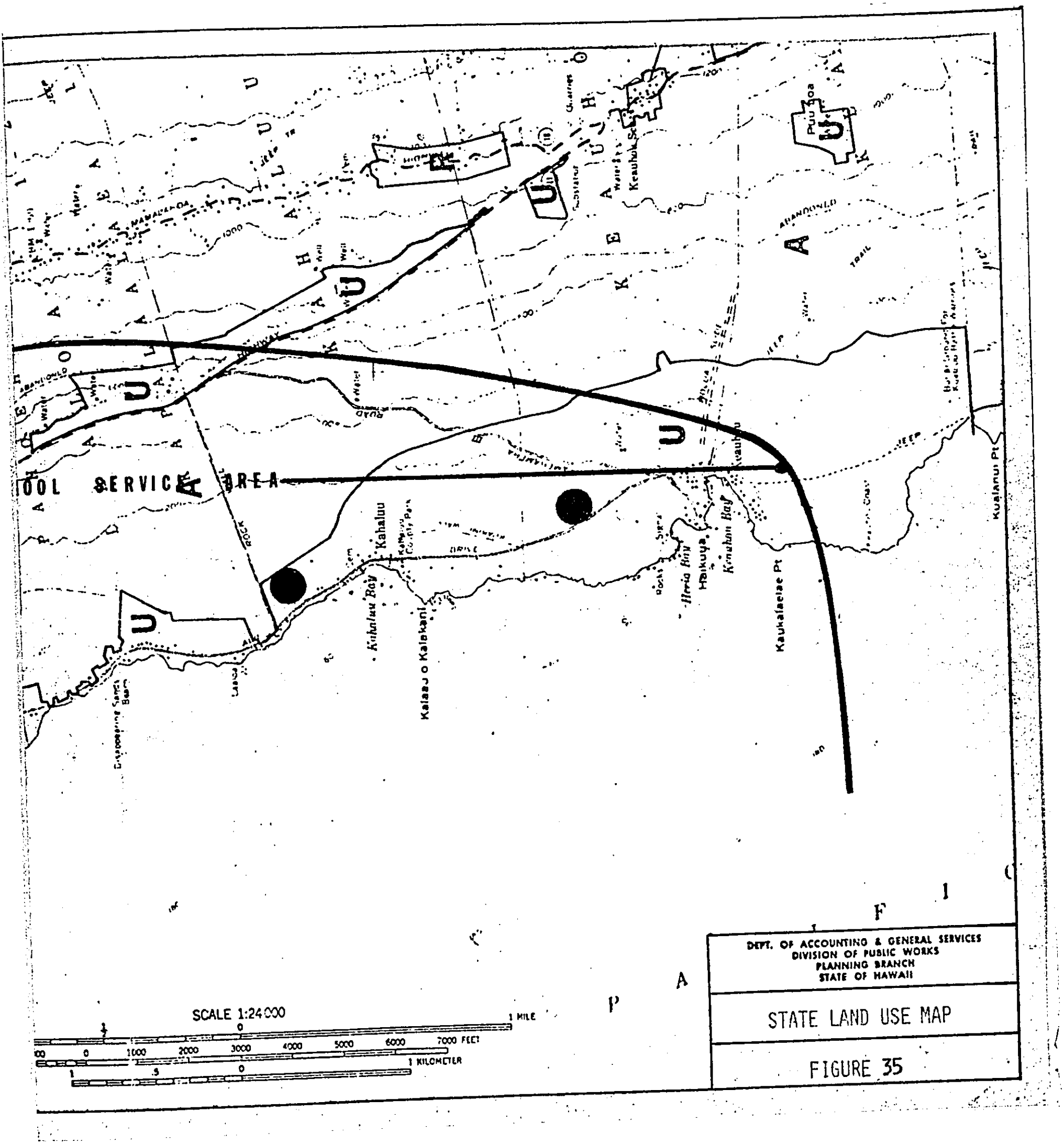
The Kona District is noted for the numerous historical sites located throughout the area. Figure 39 provides the location of the historical sites identified in the Kailua-Keauhou vicinity. The alternative school sites selected are located outside the historical sites identified on the map. An archaeological reconnaissance survey of the potential school sites will be conducted to ensure that significant historical sites will not be destroyed by the school development.

SHORELINE PROTECTION

Figure 40 shows the special management zone for the Kailua-Keauhou area. The boundary extends mauka from the shoreline to Kuakini Highway from Kailua, along Kuakini Wall, and along the proposed Alii Highway alignment to Keauhou. All



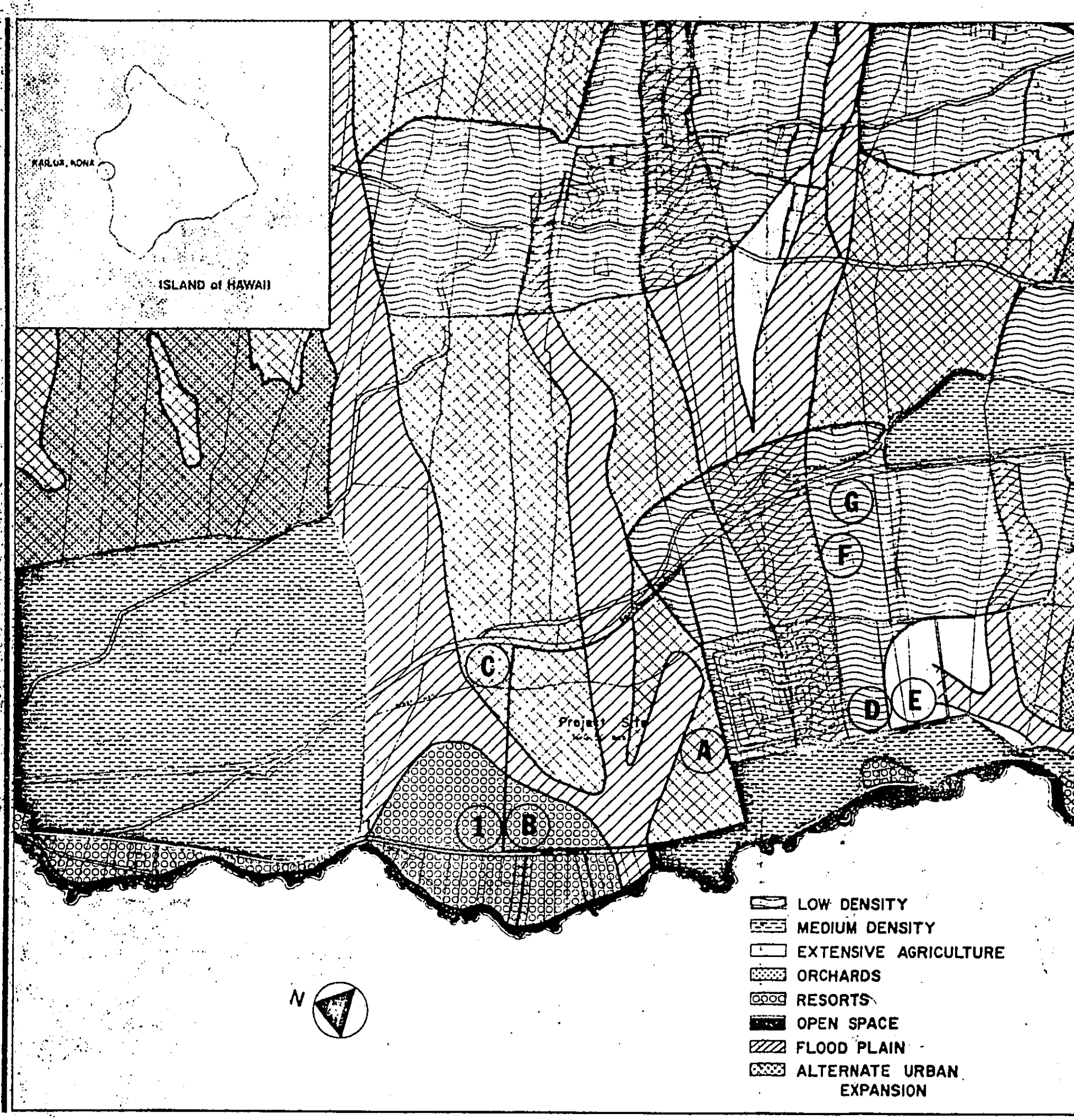
Kailua
Kailua Bay
Lanikea
Oneo Bay
Kaina Paakai
Waiaha
PACIFIC OCEAN
Kahului Bay
Puapuaa Pt
Holualoa Bay
Kamoa Pt
Holualoa
Holualoa Sch
Kaohu Cemetery
BM 1483
KEOPU
HONUAULA
HIENALOLI
AUHAUKEAE
PUAA
WAIAHA
KAHULUI
PUAPUAA
HOLUALOA
PAHOEHOE
KUAKINI HIGHWAY
NORTH KONA WATER SYSTEM
(ABOVEGROUND PIPELINE)
FENCE LINE
JEEP TRAIL
APPROXIMATE BOUNDARY
SCHOOL

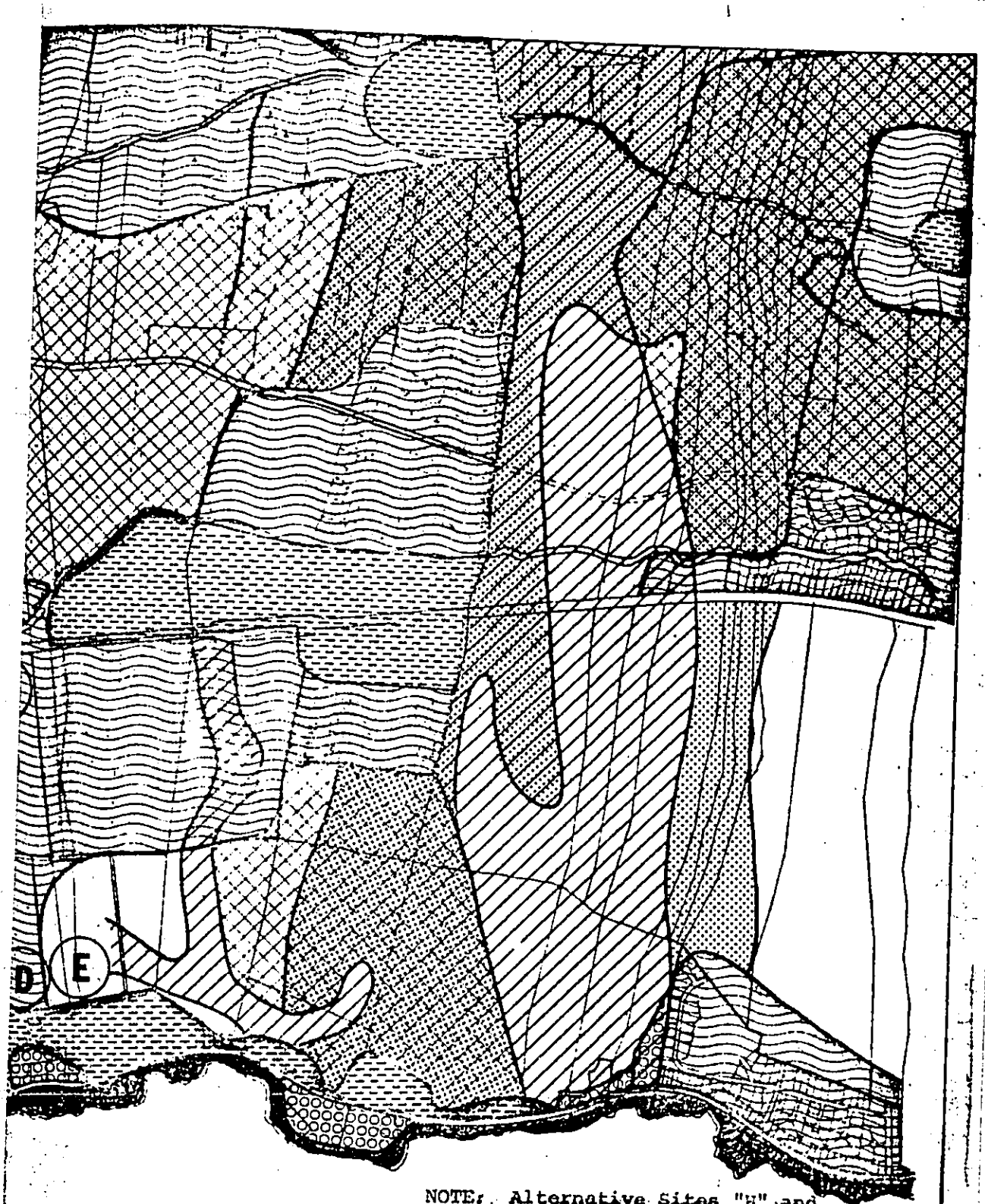


DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

STATE LAND USE MAP

FIGURE 35


KAILUA, KONA
ISLAND of HAWAII
G
F
C
D
E
A
B
Project Site
N
LOW DENSITY
MEDIUM DENSITY
EXTENSIVE AGRICULTURE
ORCHARDS
RESORTS
OPEN SPACE
FLOOD PLAIN
ALTERNATE URBAN EXPANSION



NOTE: Alternative Sites "E" and "2" not shown on this figure are planned as follows:

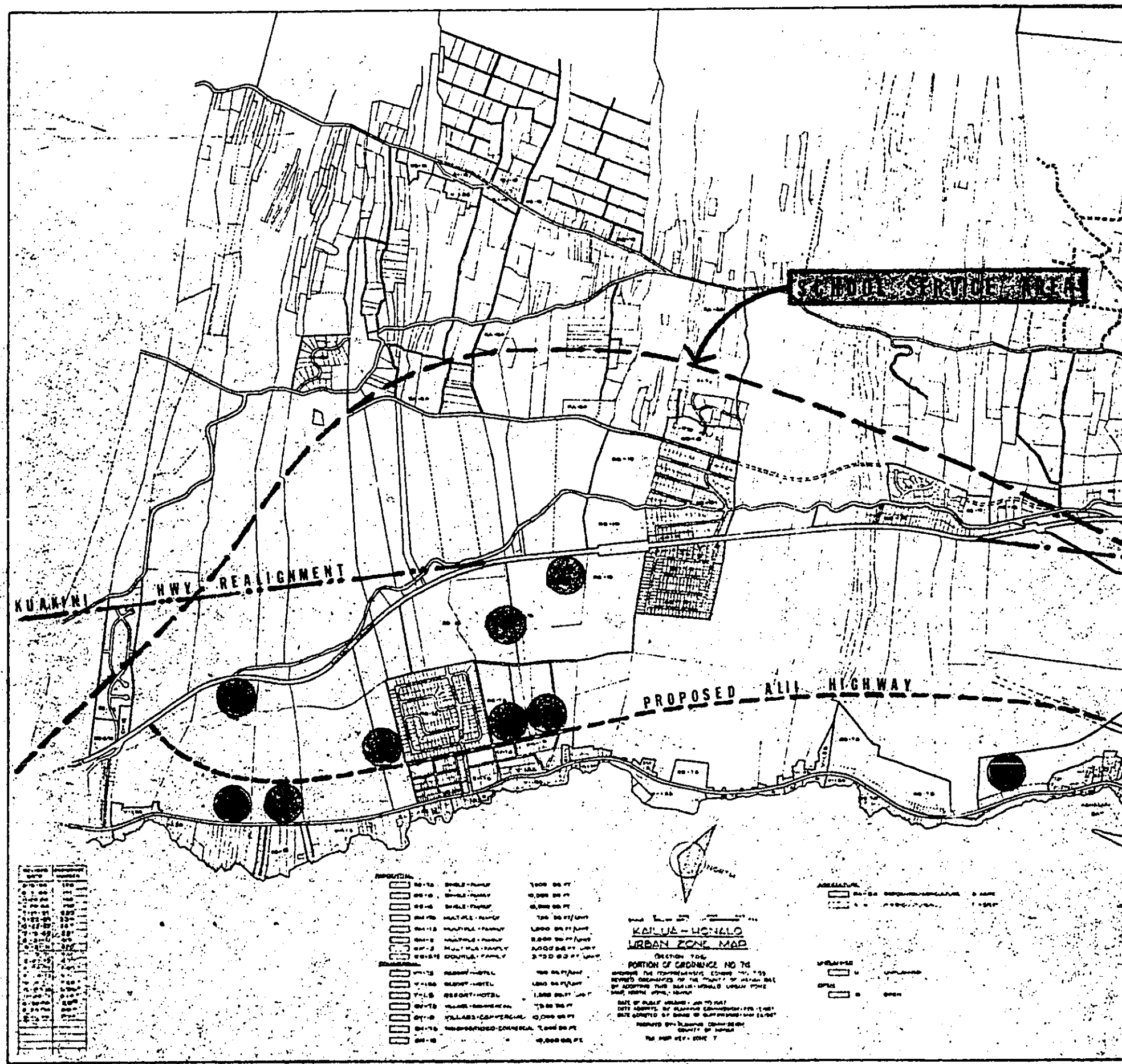
"E" - medium density
"2" - low density

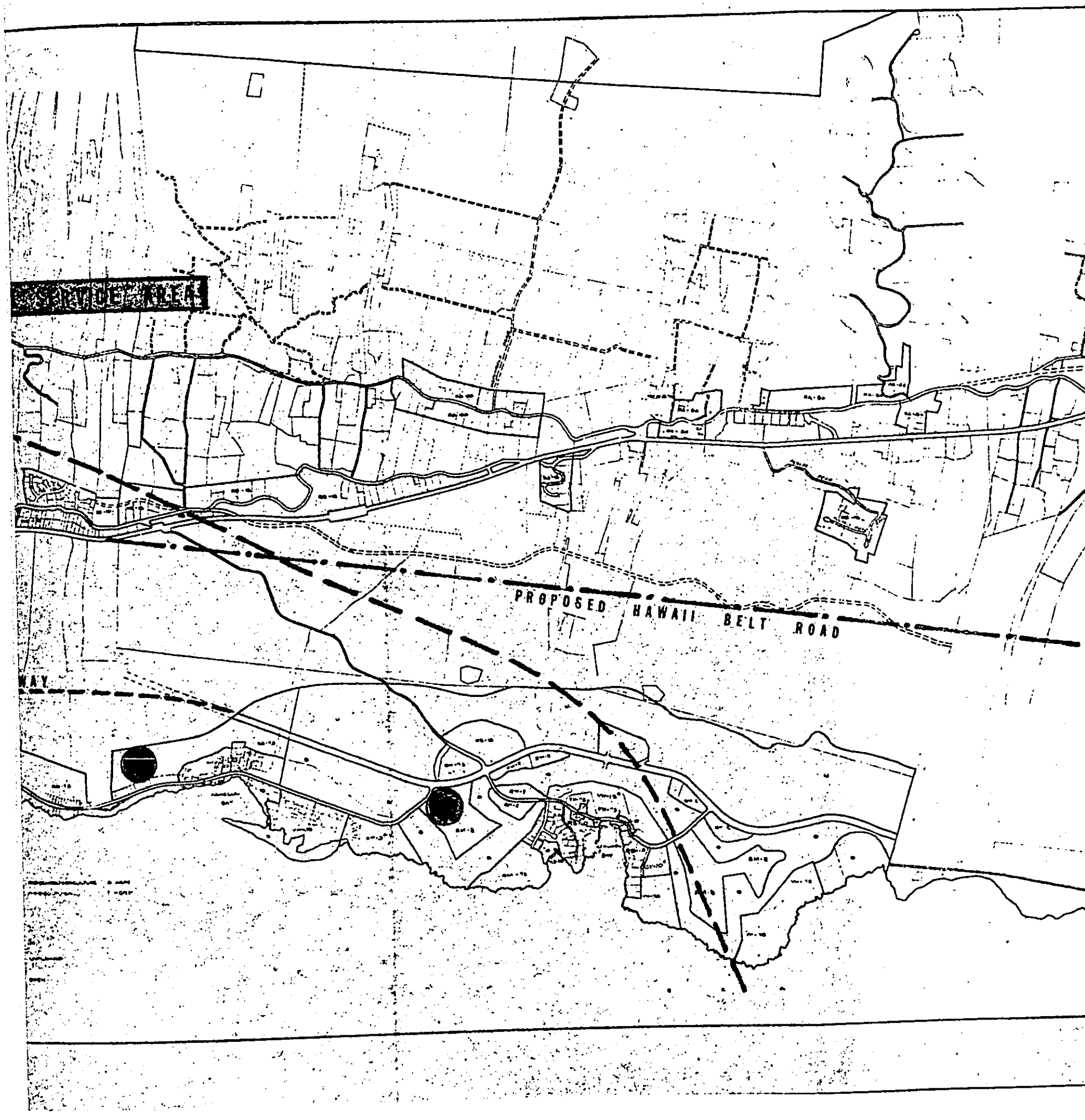
NSITY
DENSITY
IVE AGRICULTURE
DS
S
PACE
PLAIN
ATE URBAN
PANSION

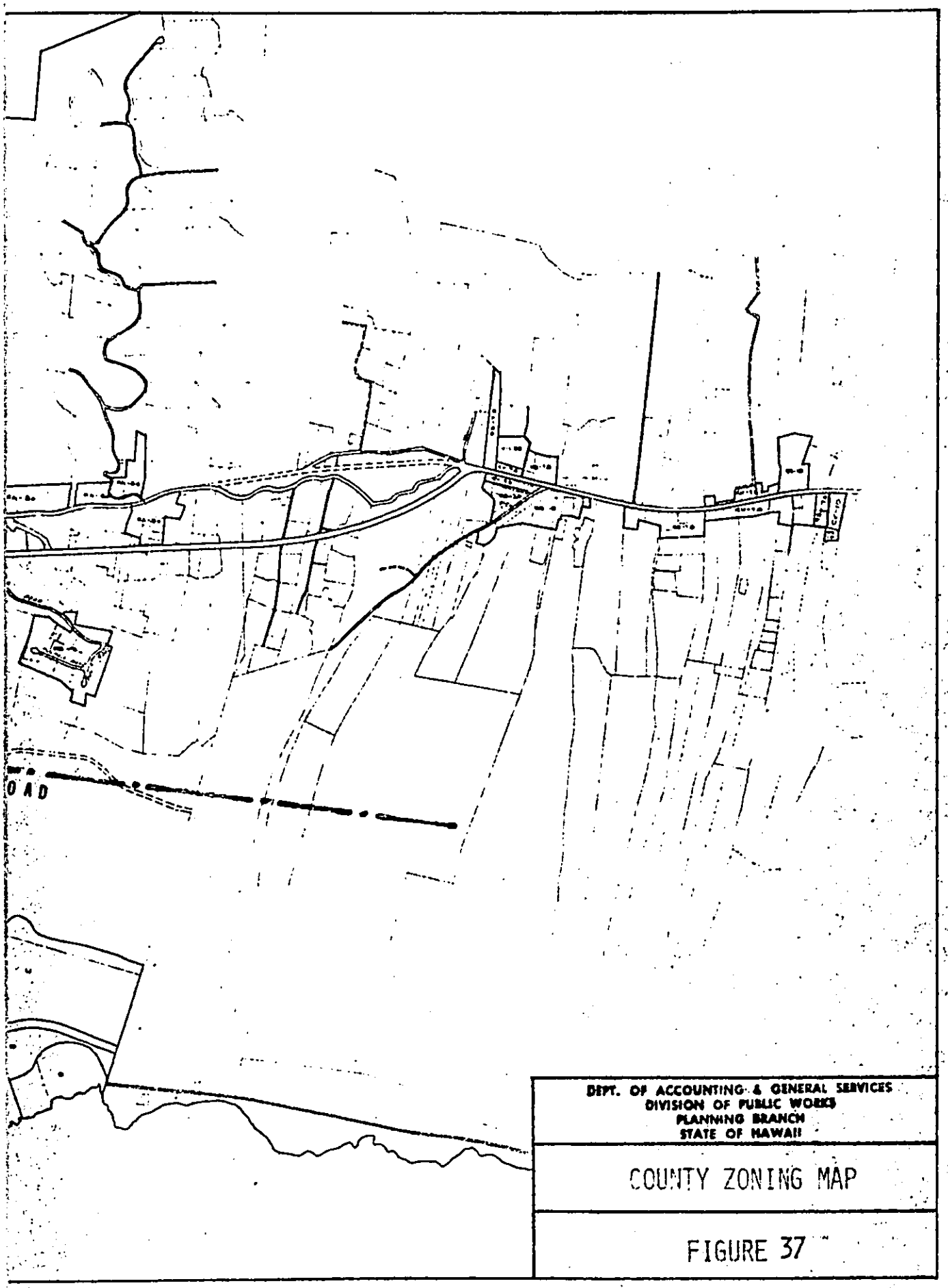
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

COUNTY GENERAL PLAN

FIGURE 36


KUAKINI HWY. REALIGNMENT
PROPOSED ALII HIGHWAY
KAILUA - HONALO
URBAN ZONE MAP
PORTION OF ORDINANCE NO 76

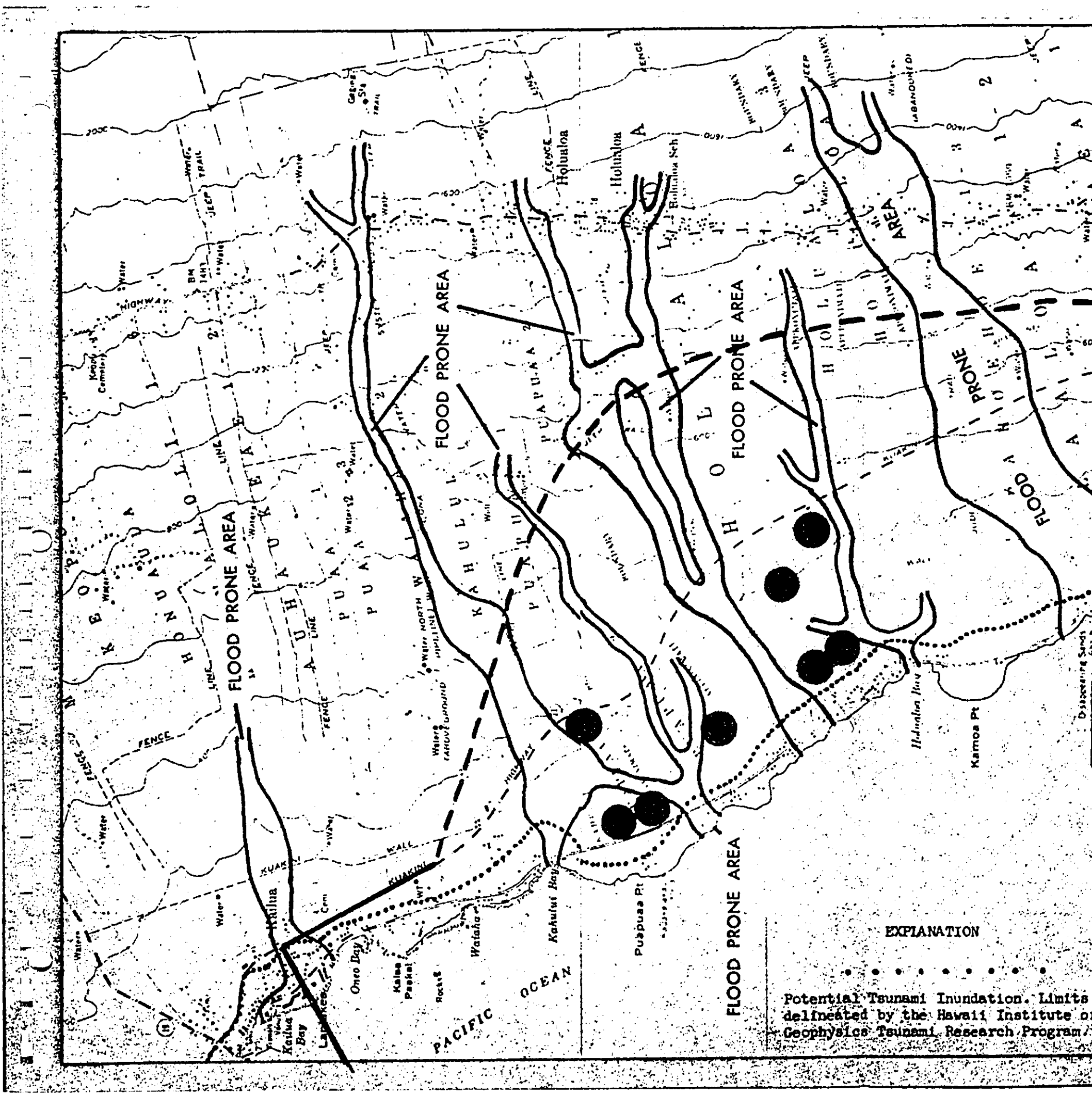

PROPOSED HAWAII BELT ROAD

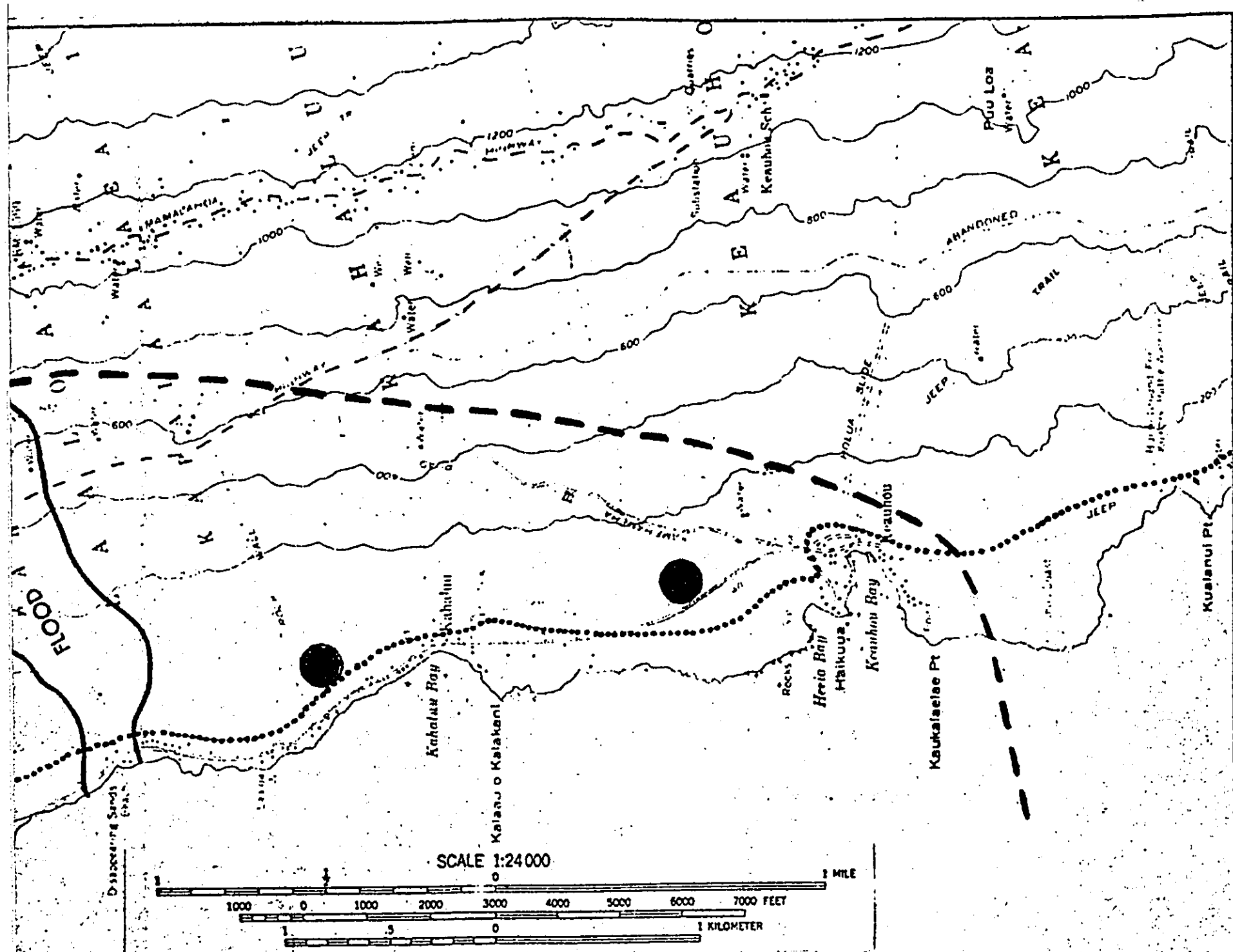


DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

COUNTY ZONING MAP

FIGURE 37


FLOOD PRONE AREA
FLOOD PRONE AREA
FLOOD PRONE AREA
FLOOD PRONE AREA
FLOOD PRONE AREA
PACIFIC OCEAN
Holualoa
Kailua
Kailua Bay
Oneo Bay
Kahului Bay
Puapuaa Pt
Kamoa Pt
Holualoa Bay
KUAKINI WALL
HIGHWAY
FENCE
JEEP TRAIL
EXPLANATION
Potential Tsunami Inundation. Limits
delineated by the Hawaii Institute o
Geophysics Tsunami Research Program.



Approximate boundaries of flood-prone areas are shown on this map. There is, on the average, about 1 chance in 100 that the designated areas will be inundated in any year. This information is important to public agencies and private citizens concerned with future land developments.

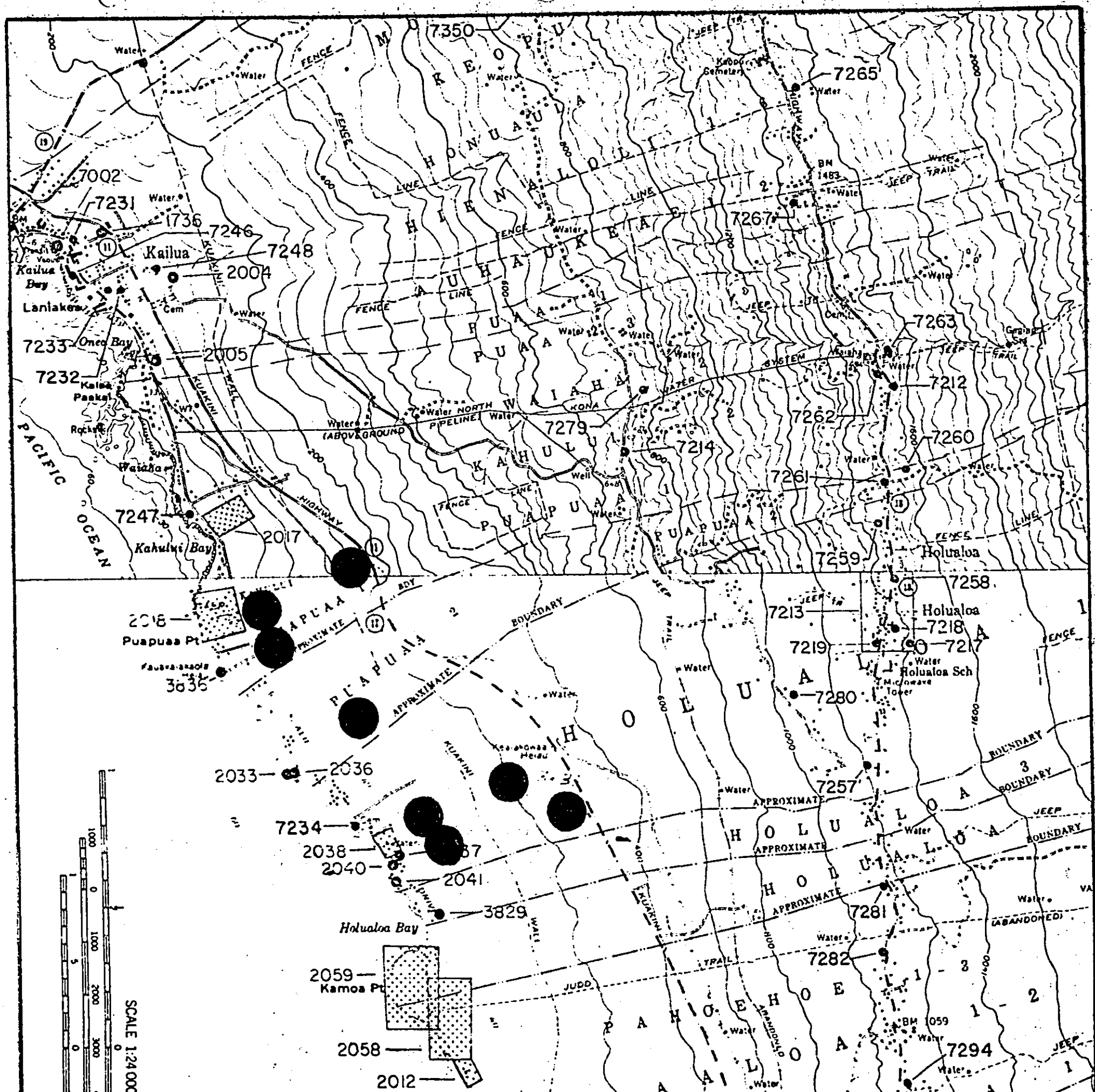
The flood-prone areas have been delineated through use of readily available information on past floods rather than from detailed field surveys and inspections. In general, the delineated areas are for natural conditions and do not take into consideration the possible effects of existing or proposed flood control structures except where those effects could be evaluated. Flood areas have been identified for: (1) urban areas where the upstream drainage basin exceeds 25 square miles, (2) rural areas in humid regions where the upstream drainage basin exceeds 100 square miles, (3) rural areas in semiarid regions where the upstream drainage basin exceeds 250 square miles, and (4) smaller drainage basins, depending on topography and potential use of the flood plains.

The 89th Congress, in House Document 465, recommended the preparation of flood-prone area maps to assist in minimizing flood losses by quickly identifying the areas of potential flood hazards. More detailed flood information may be required for other purposes such as structural designs, economic studies, or formulation of land-use regulations. Such detailed information may be obtained from the U.S. Geological Survey, other Federal agencies, or State, local, and private agencies.

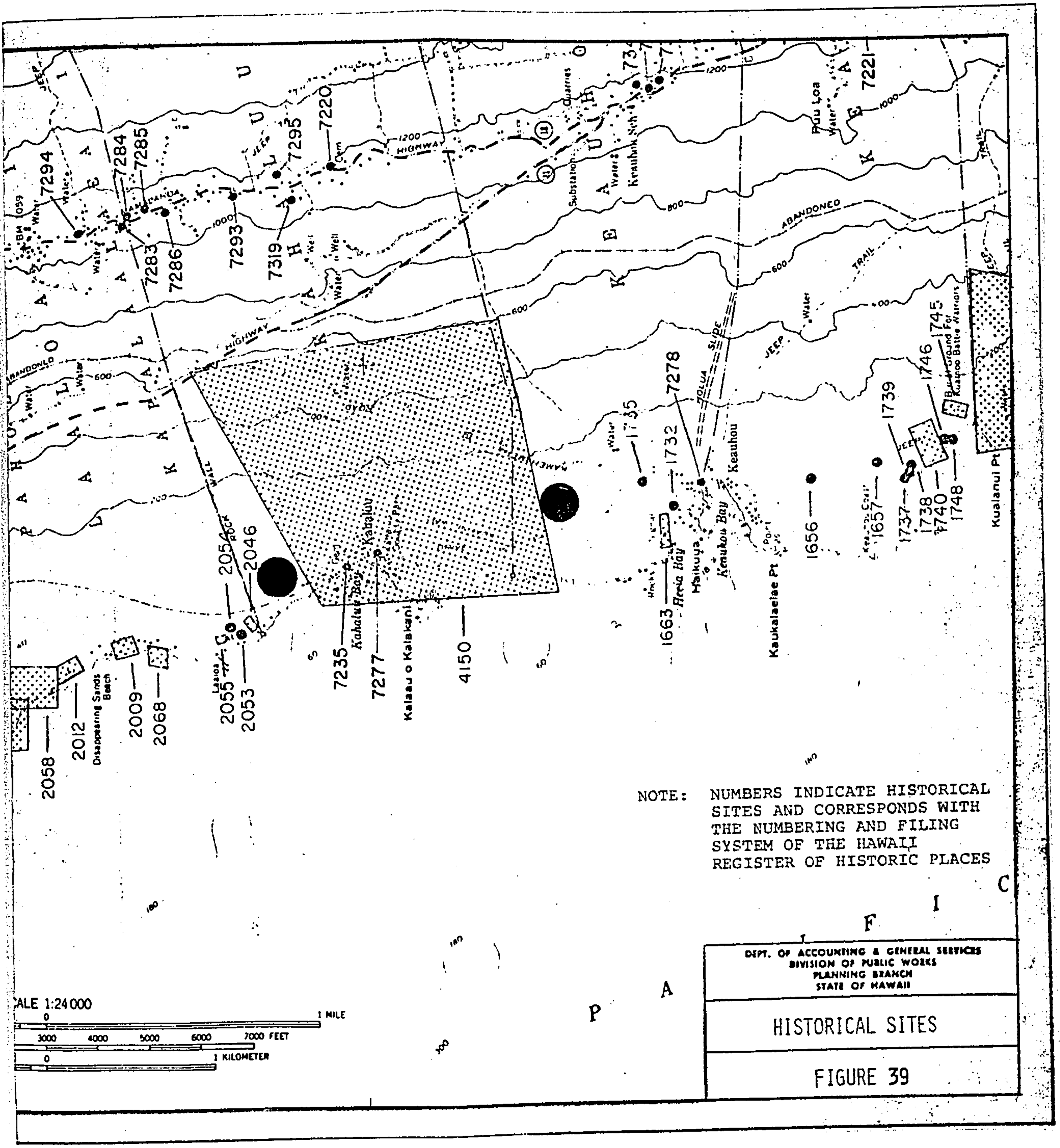
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

FLOOD PRONE AREAS

FIGURE 38



7350
7265
7002
7231
1736
7246
7248
Kailua
2004
Kailua Bay
Laniakea
7233
Onea Bay
2005
7232
Kalea Paakai
Rocks
Waiaha
7247
Kahului Bay
2017
PACIFIC OCEAN
7267
7263
7212
7262
7260
7261
7279
7214
7259
Holualoa
7258
7213
Holualoa
7218
7219
7217
Holualoa Sch
7280
7257
7281
7282
7294
2018
Puapuaa Pt
3836
2033
2036
7234
2038
2040
2041
3829
Holualoa Bay
2059
Kamoa Pt
2058
2012
SCALE 1:24 000

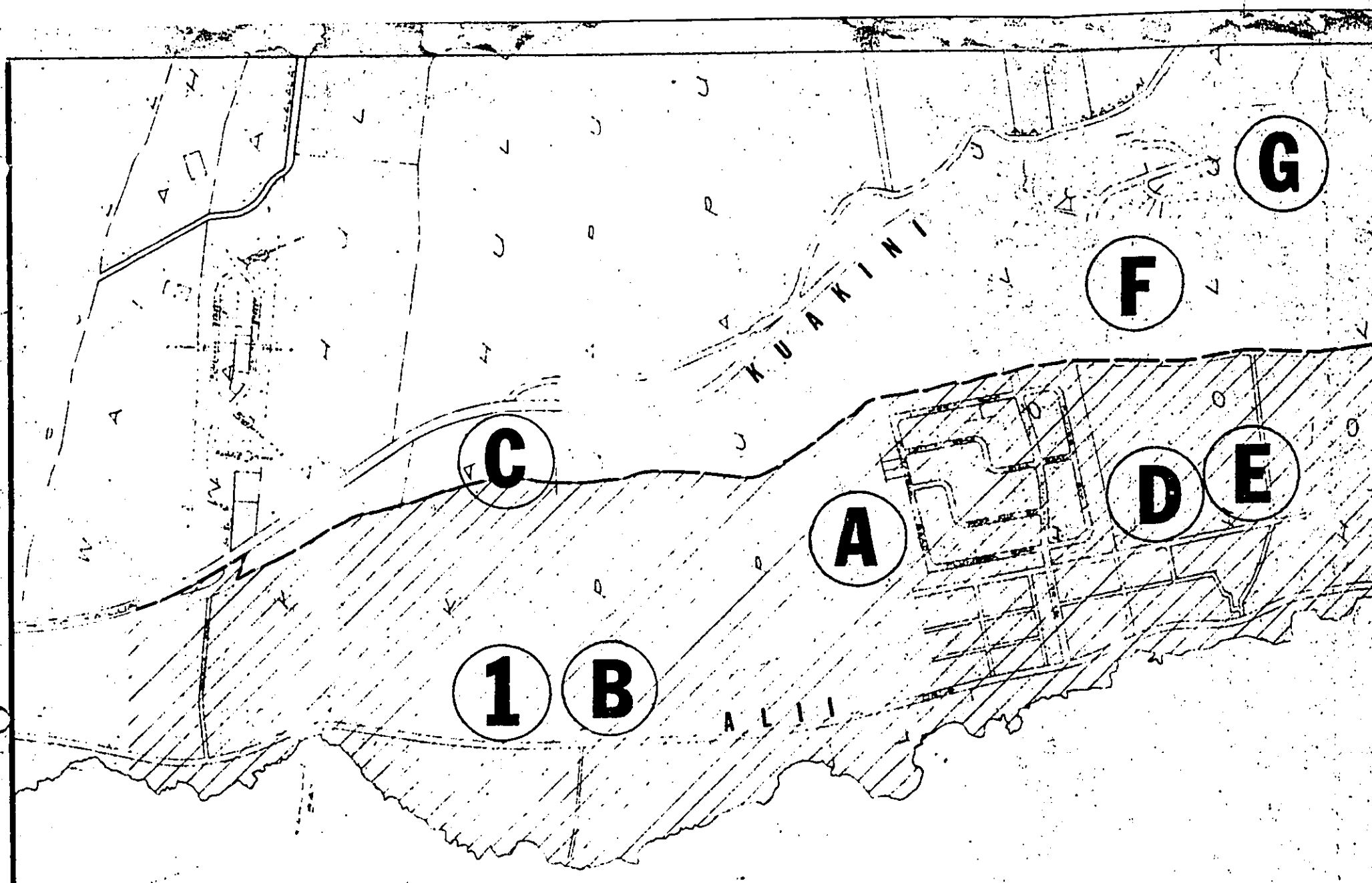


NOTE: NUMBERS INDICATE HISTORICAL SITES AND CORRESPONDS WITH THE NUMBERING AND FILING SYSTEM OF THE HAWAII REGISTER OF HISTORIC PLACES

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

HISTORICAL SITES

FIGURE 39



PORTION OF

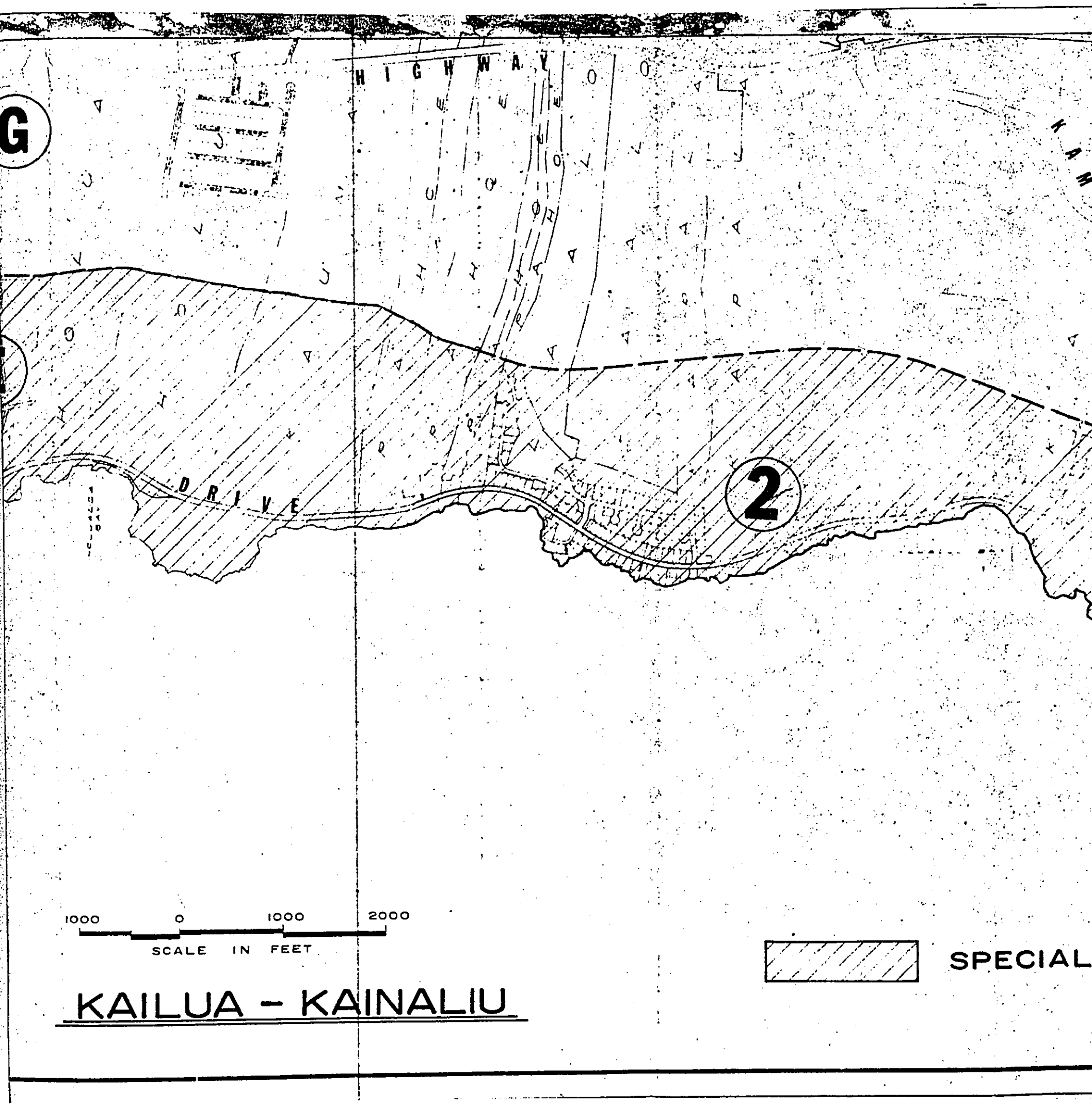
SPECIAL MANAGEMENT AREA

PURSUANT TO ACT 176, SLH 1975

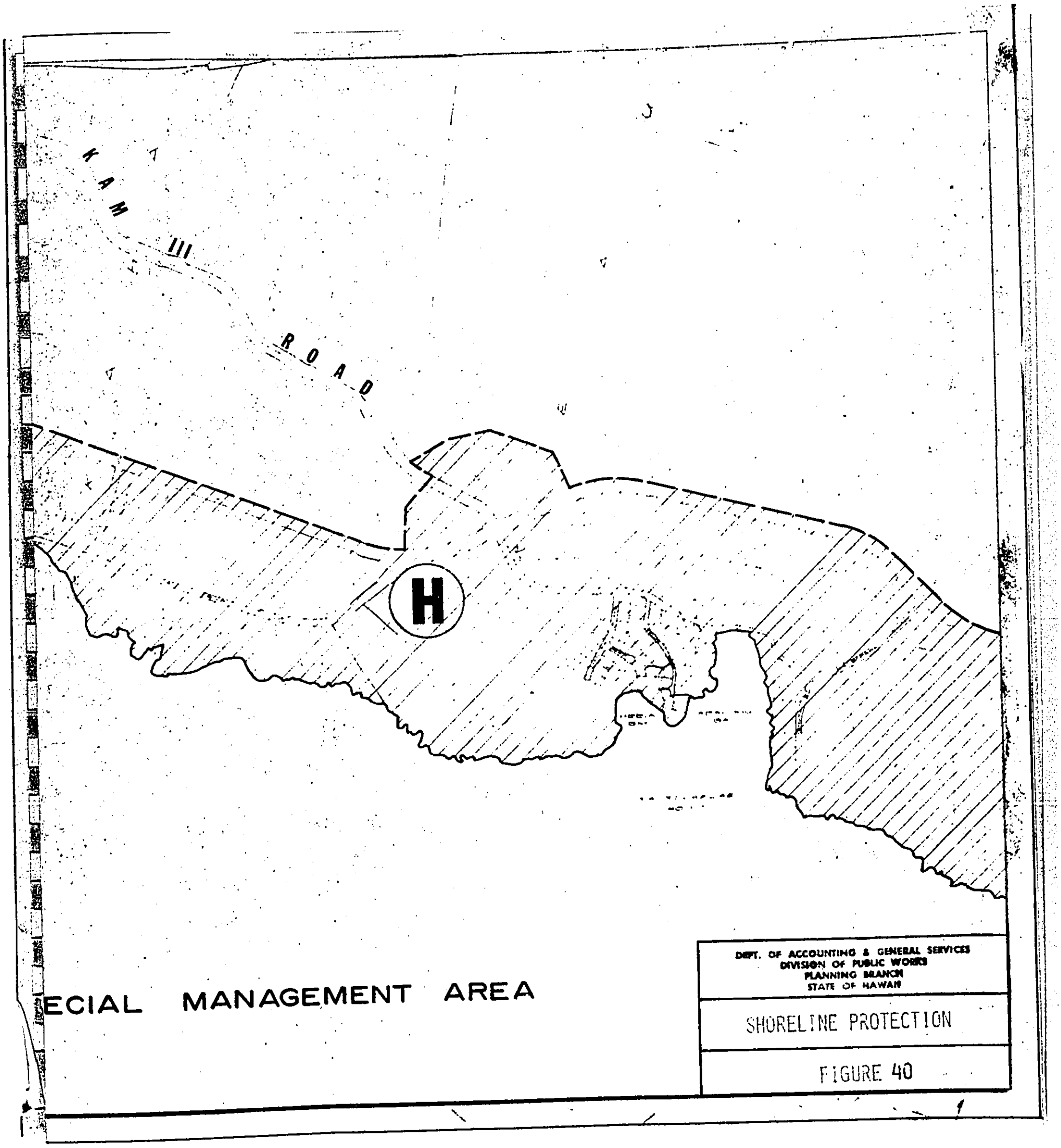
DATE OF PUBLIC HEARING : OCT. 28, 29
NOV. 3, 4, 5, 10, 11, 13, 1975

DATE FILED WITH PLANNING COMMISSION : DEC. 1, 1975

PREPARED BY : PLANNING DEPARTMENT
COUNTY OF HAWAII



KAILUA - KAINALIU


KAM III ROAD
H
ECIAL MANAGEMENT AREA
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII
SHORELINE PROTECTION
FIGURE 40

of the alternative sites except Sites C, F and G are within the special management area. If a site is selected within the area, it will be necessary to comply with the Environmental Shoreline Protection regulations of the County of Hawaii.

The primary objective of the rules and regulations is to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii. Since the proposed school development will exceed $25,000, the project will require the following:

1. Application for a User Permit
2. Environmental Impact Statement
3. Public Hearing
4. Action by the Authority
5. Assessment of Areas of Critical Concern

None of the foregoing requirements are expected to create major obstacles in the school development since the alternative sites are located more than 800 feet from the shoreline, the school is a public facility, and the site selected will require an EIS regardless of its location.

WATER SYSTEM

Figure 41 shows the existing and proposed water system for North Kona. The existing water system in the Kailua-Keauhou vicinity is currently being improved by the development of the Kahaluu Shaft project. The project will provide additional source improvements to the water system and is scheduled for completion by 1978. Based on this, all of the alternative sites can be provided with adequate water service by extension of the existing distribution system.

SEWER SYSTEM

The proposed sewerage system for North Kona is shown in Figure 42. The County has no timetable for implementation of the sewer system at this time. Only Alternative Sites H and 2 can be serviced by the sewerage system which was constructed for the Keauhou Bay resort development. All of the other alternative sites must be provided with an interim sewage disposal system which meets the applicable environmental health regulations until the County system is constructed.

DRAINAGE SYSTEM

Figure 43 shows the proposed Holualoa Drainage Channel improvements which were adopted by Hawaii County Ordinance

No. 586. The plan provides a conceptual basis for accommodating the existing flooding conditions of the Holualoa School Stream and the Horseshoe Bend Stream. The proposed improvements will affect Alternative Site D which abuts the proposed drainage channel along Alii Kai Subdivision. If Site D is selected for the school, it may be necessary to construct portions of the channel improvements to prevent flooding of the site.

RAINFALL

Figure 44 shows the median annual rainfall for North Kona. The map shows that the school service area is below the 40-inch rainfall contour. Accordingly, all of the alternative sites have less than 40 inches rainfall and therefore would not qualify for covered walkways and paved courts based on present DOE criteria.

AGRICULTURAL LAND CLASSIFICATION

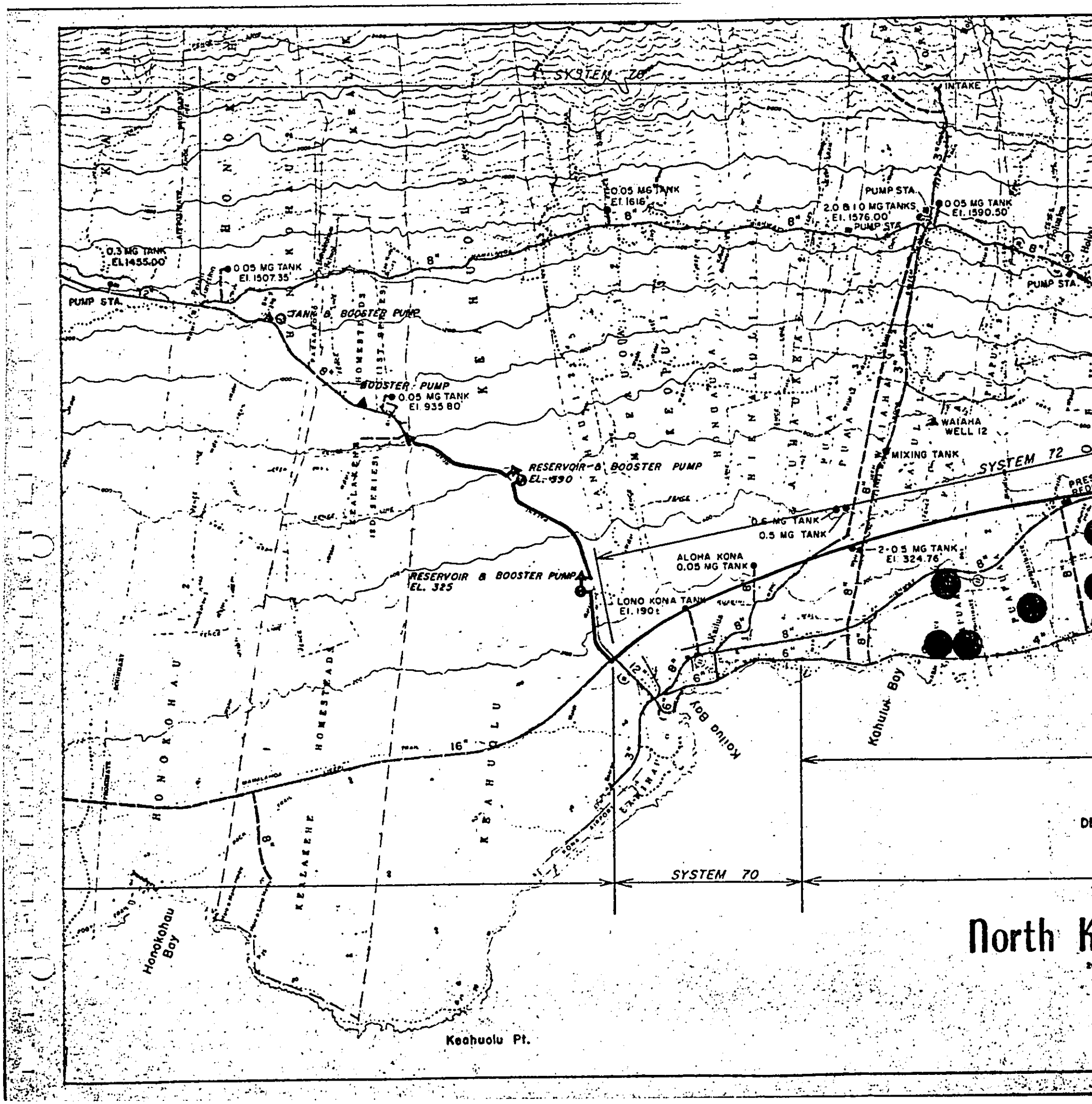
The agricultural land classification for the alternative sites is shown on Figure 45. This map was extracted from the University of Hawaii's Land Study Bureau Bulletin No. 6 - "Detailed Land Classification - Island of Hawaii", published in November 1965. The alternative sites and their respective agricultural classification are as shown in Table 14.

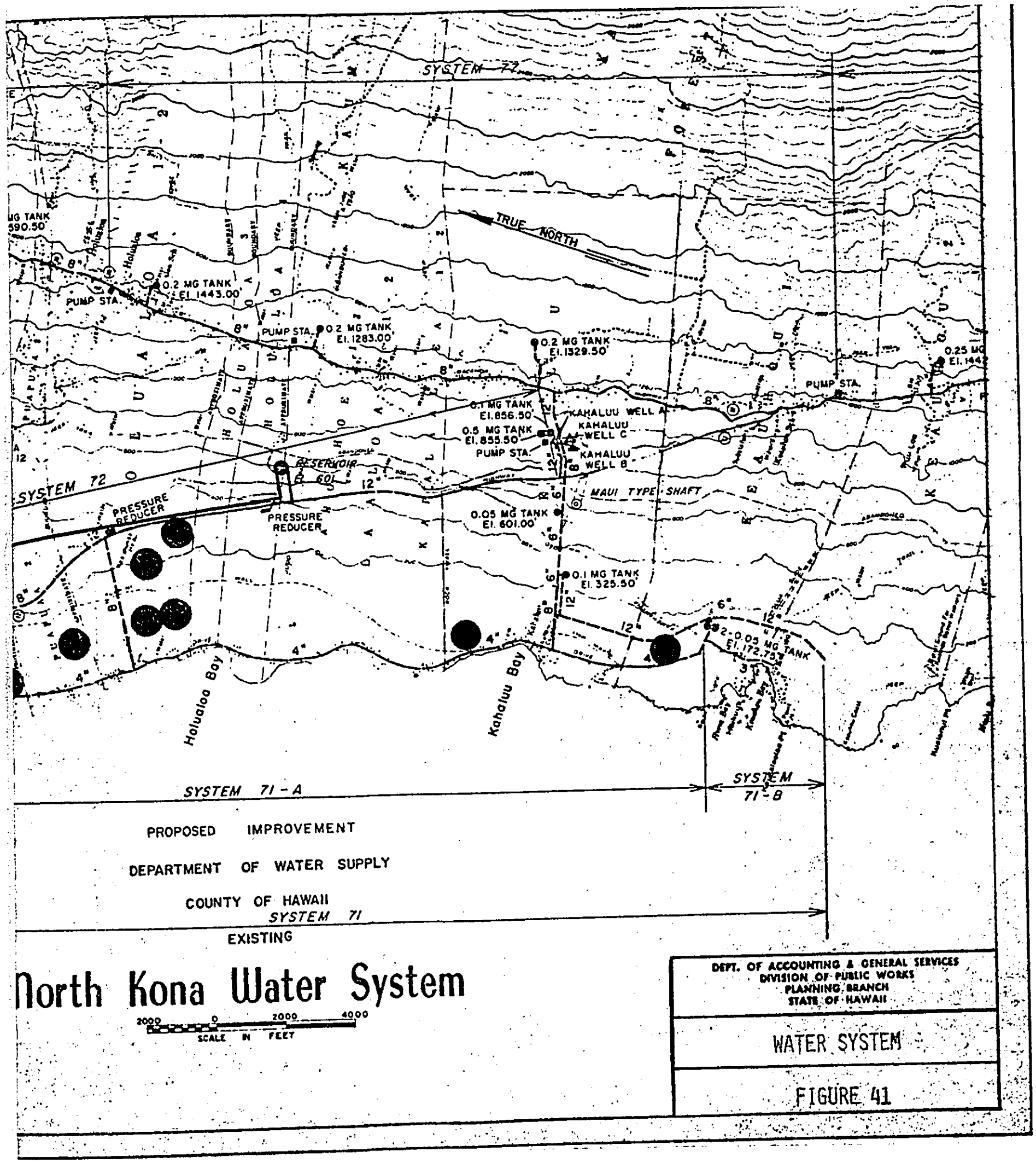
TABLE 14
AGRICULTURAL LAND CLASSIFICATION

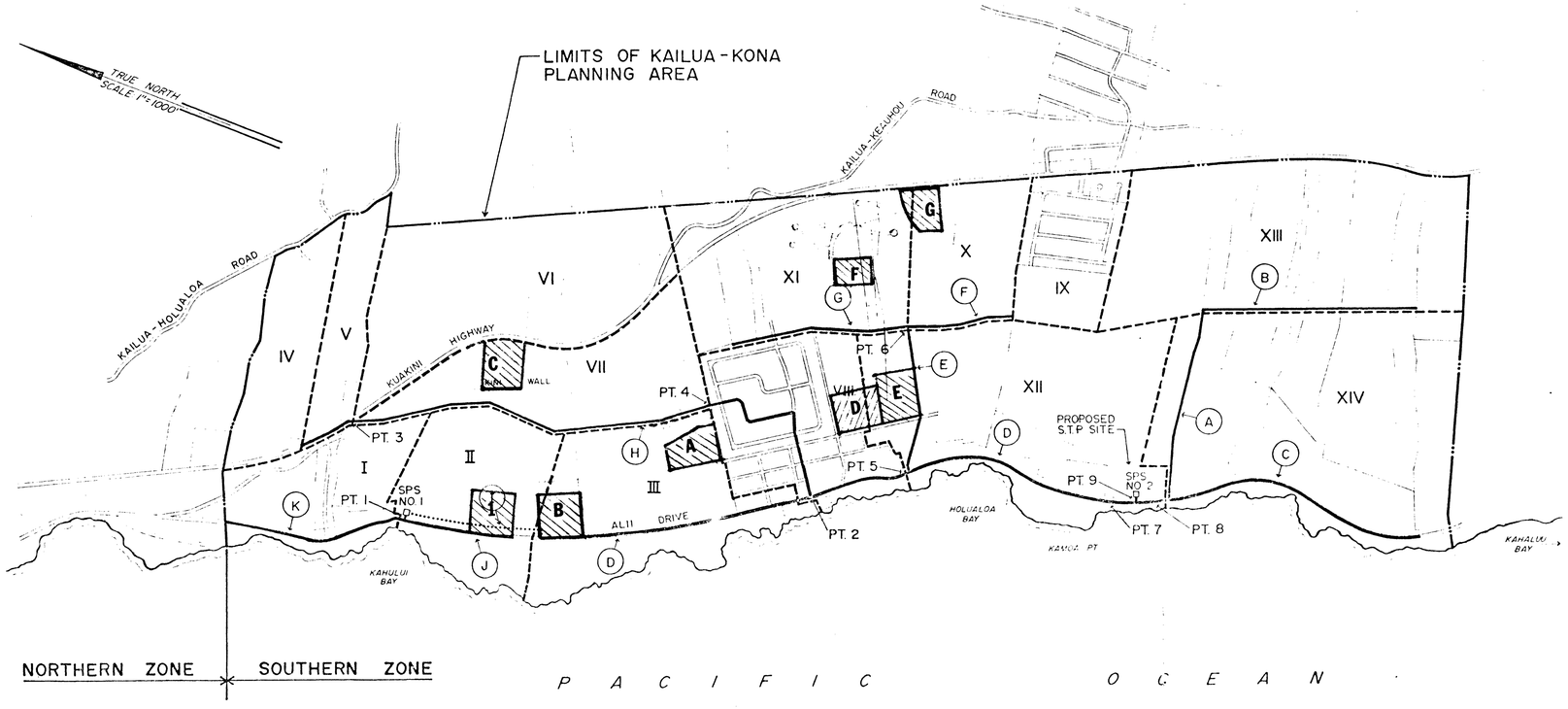
Site	Land Classification
A	E285
B	E233
C	E233
D	E285
E	E285
F	E285
G	E285
H	E319
1	E285
2	E285

The letter designation indicates the overall master productivity rating as follows:

A - Very Good
B - Good
C - Fair
D - Poor
E - Very Poor


SYSTEM 78
INTAKE
0.05 MG TANK
El. 1616'
PUMP STA.
2.0 & 1.0 MG TANKS
El. 1576.00'
PUMP STA.
0.05 MG TANK
El. 1590.50'
0.3 MG TANK
EL 1455.00'
0.05 MG TANK
El. 1507.35'
PUMP STA.
TANK & BOOSTER PUMP
BOOSTER PUMP
0.05 MG TANK
El. 935.80'
WAIAHA
WELL 12
MIXING TANK
SYSTEM 72
RESERVOIR & BOOSTER PUMP
EL. 590
0.5 MG TANK
0.5 MG TANK
ALOHA KONA
0.05 MG TANK
2-0.5 MG TANK
El. 324.76'
RESERVOIR & BOOSTER PUMP
EL. 325
LONO KONA TANK
El. 190±
Kailua Bay
Kahuluu Bay
HONOKOHAU
HOMESTEADS
KEALAKEHE
KEAHUOLU
SYSTEM 70
Honokohau Bay
Keahuolu Pt.
North K


SYSTEM 72
TRUE NORTH
0.2 MG TANK
El. 1443.00'
PUMP STA.
0.2 MG TANK
El. 1283.00'
0.2 MG TANK
El. 1329.50'
0.1 MG TANK
El. 856.50'
KAHALUU WELL A
0.5 MG TANK
El. 855.50'
KAHALUU WELL C
KAHALUU WELL B
RESERVOIR
601
MAUI TYPE SHAFT
PRESSURE REDUCER
0.05 MG TANK
El. 601.00'
0.1 MG TANK
El. 325.50'
2-0.05 MG TANK
El. 172.75'
Holualoa Bay
Kahaluu Bay
SYSTEM 71-A
SYSTEM 71-B
PROPOSED IMPROVEMENT
DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII
SYSTEM 71
EXISTING
North Kona Water System
2000 0 2000 4000
SCALE IN FEET
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII
WATER SYSTEM
FIGURE 41



ESTIMATED SEWAGE FLOWS

PT.	AREA	AVE. (MGD)	CUMMULATIVE AVE. (MGD)	PEAK (MGD)
	I	0.347		
	II	0.530		
1			0.877	3.1
	III	0.485		
2			1.362	4.6
	IV	0.168		
	V	0.079		
3		0.247		
	VI	0.390		
	VII	0.232		
4		0.622		
	VIII	0.420		
5			2.651	8.1
	IX	0.197		
	X	0.067		
	XI	0.252		
6		0.516		
	XII	0.866		
7			4.033	11.5
	XIII	0.603		
	XIV	0.543		
8		1.146		
9			5.179	14.4

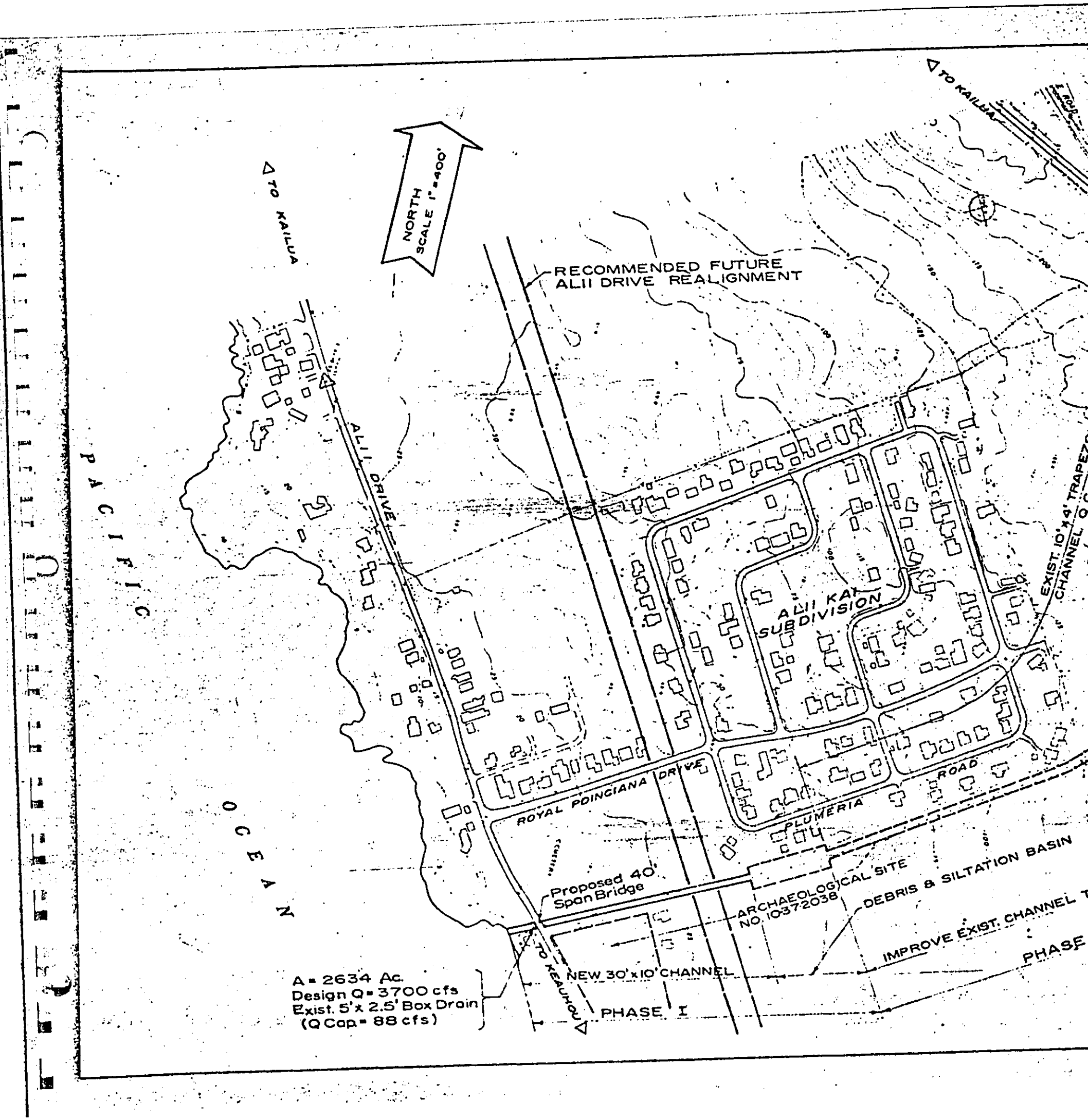
LEGEND

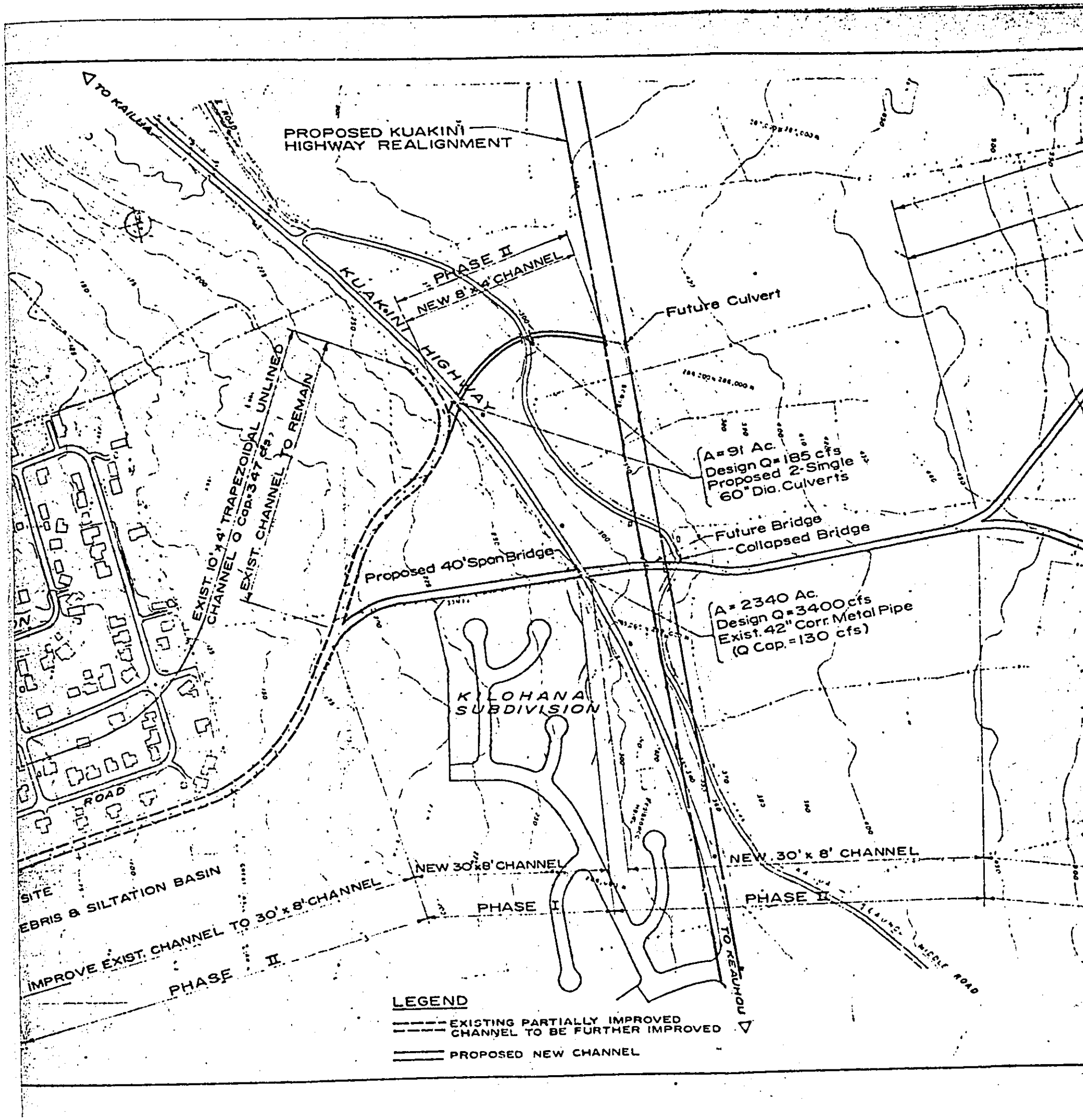
- PROPOSED SEWERS
- PROPOSED FORCE MAIN
- LIMITS OF KAILUA-KONA PLANNING AREA
- TRIBUTARY AREA BOUNDARY
- I TRIBUTARY AREA DESIGNATIONS
- (B) SEWER LINE/FORCE MAIN DESIGNATIONS
- □ PROPOSED SEWAGE PUMPING STATIONS

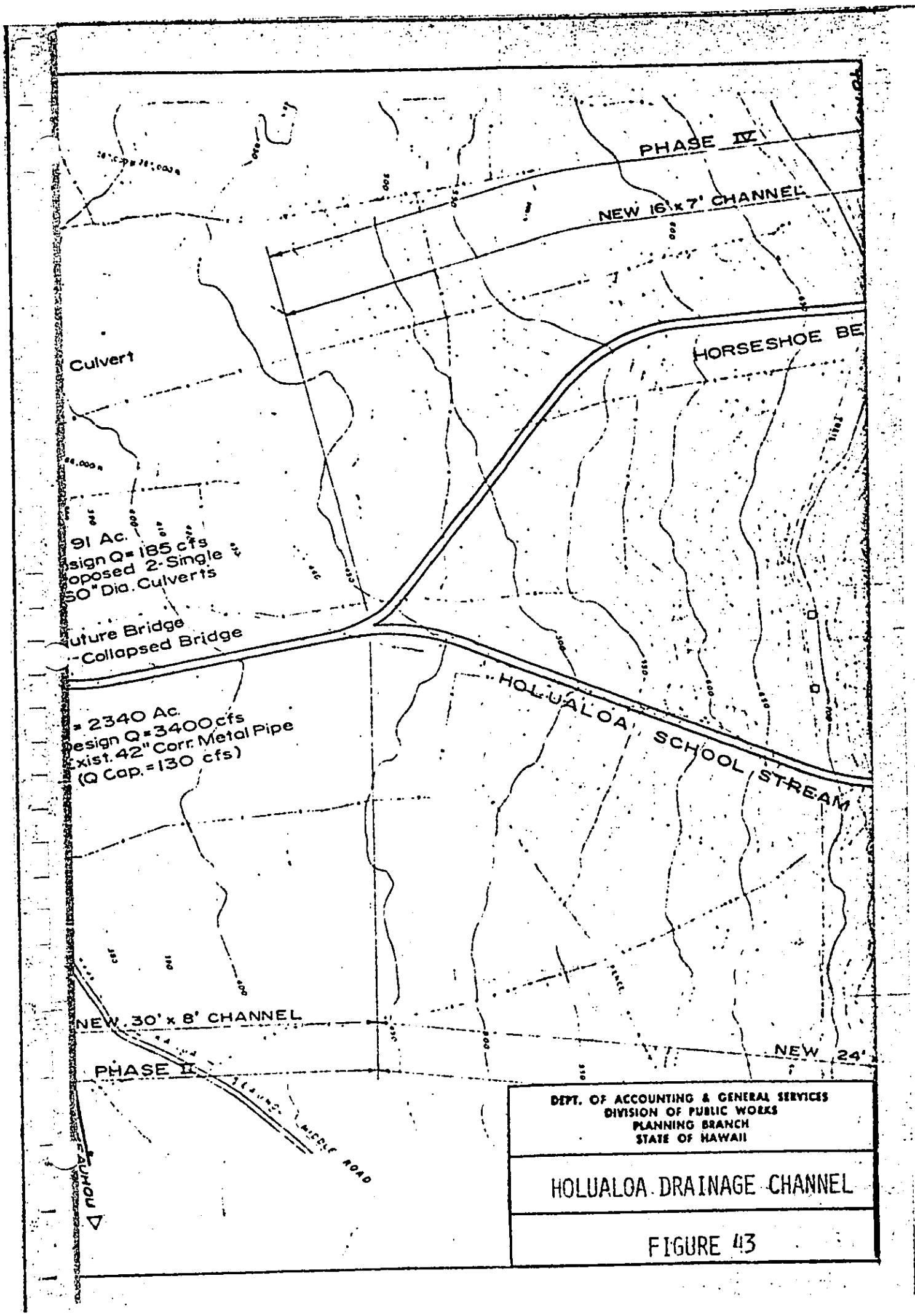
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII

SCHEMATIC SKETCH

FIGURE 42


NORTH
SCALE 1" = 400'
TO KAILUA
TO KAILUA
RECOMMENDED FUTURE
ALII DRIVE REALIGNMENT
ALII DRIVE
ALII KAI
SUBDIVISION
EXIST. 10' x 4' TRAP
CHANNEL
ROYAL POINCIANA DRIVE
PLUMERIA ROAD
Proposed 40'
Span Bridge
ARCHAEOLOGICAL SITE
NO. 10-37-2038
DEBRIS & SILTATION BASIN
IMPROVE EXIST. CHANNEL
PHASE
NEW 30' x 10' CHANNEL
PHASE I
TO KEAUHOU
A = 2634 Ac.
Design Q = 3700 cfs
Exist. 5' x 2.5' Box Drain
(Q Cap = 88 cfs)
PACIFIC
OCEAN


TO KAILUA
PROPOSED KUAKINI HIGHWAY REALIGNMENT
PHASE II
NEW 8' x 4' CHANNEL
KUAKINI HIGHWAY
Future Culvert
EXIST. 10' x 4' TRAPEZOIDAL UNLINED CHANNEL Q CAP.=347 cfs
EXIST. CHANNEL TO REMAIN
A=91 Ac.
Design Q=185 cfs
Proposed 2-Single 60" Dia. Culverts
Future Bridge
Collapsed Bridge
Proposed 40' Span Bridge
A=2340 Ac.
Design Q=3400 cfs
Exist. 42" Corr. Metal Pipe
(Q Cap.=130 cfs)
KILOHANA SUBDIVISION
ROAD
NEW 30' x 8' CHANNEL
NEW 30' x 8' CHANNEL
PHASE I
PHASE II
SITE
EBRIS & SILTATION BASIN
IMPROVE EXIST. CHANNEL TO 30' x 8' CHANNEL
PHASE II
TO KEAUHOU
LEGEND
EXISTING PARTIALLY IMPROVED CHANNEL TO BE FURTHER IMPROVED
PROPOSED NEW CHANNEL


PHASE IV
NEW 16' x 7' CHANNEL
Culvert
HORSESHOE BE
91 Ac.
sign Q= 185 cfs
oposed 2-Single
50" Dia. Culverts
uture Bridge
-Collapsed Bridge
HOLUALOA SCHOOL STREAM
= 2340 Ac.
esign Q=3400 cfs
xist. 42" Corr. Metal Pipe
(Q Cap.=130 cfs)
NEW 30' x 8' CHANNEL
NEW 24'
PHASE II
MIDDLE ROAD
AUHOU
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII
HOLUALOA DRAINAGE CHANNEL
FIGURE 43

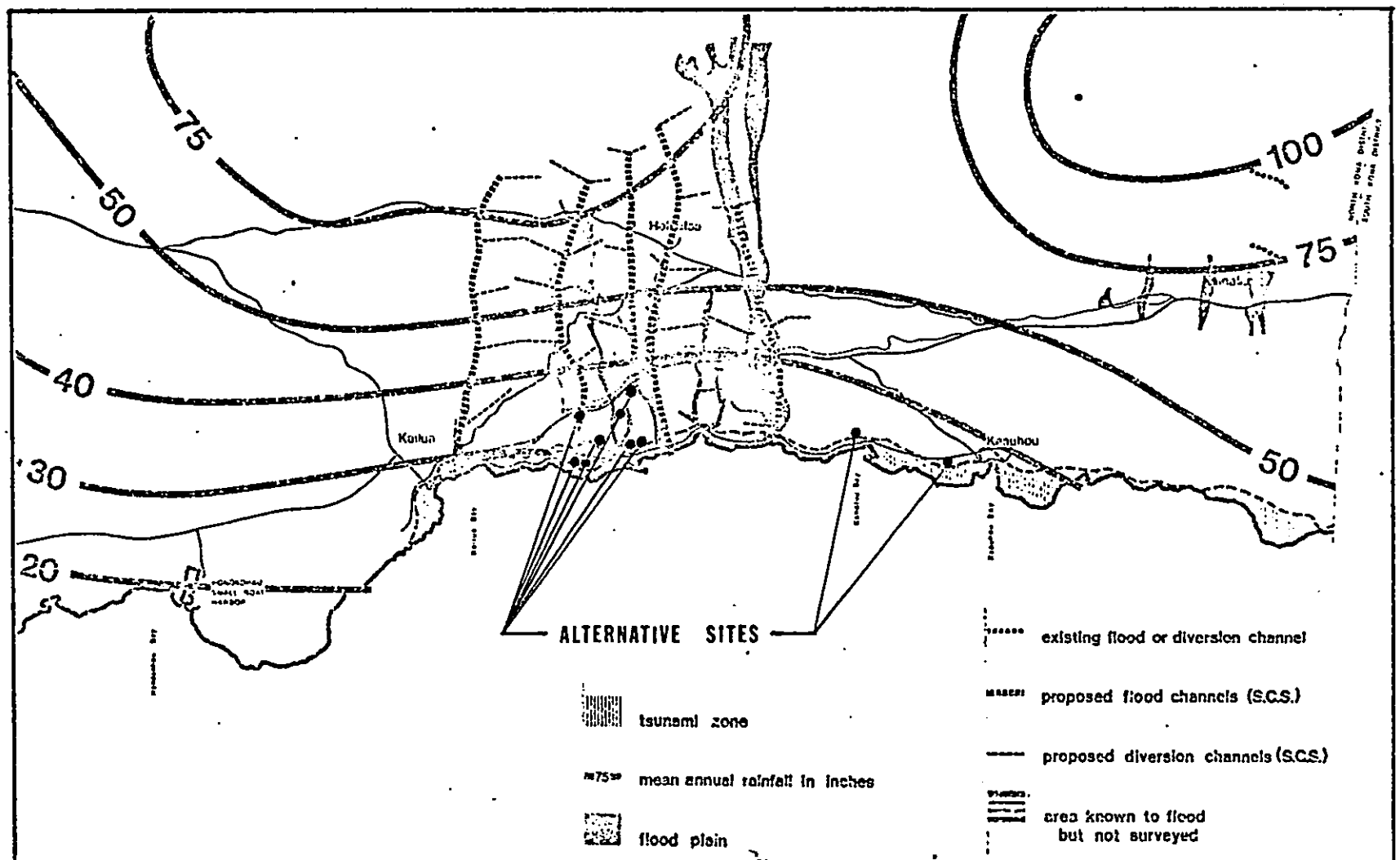


FIGURE 44	RAINFALL
STATE OF HAWAII	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS	PLANNING BRANCH

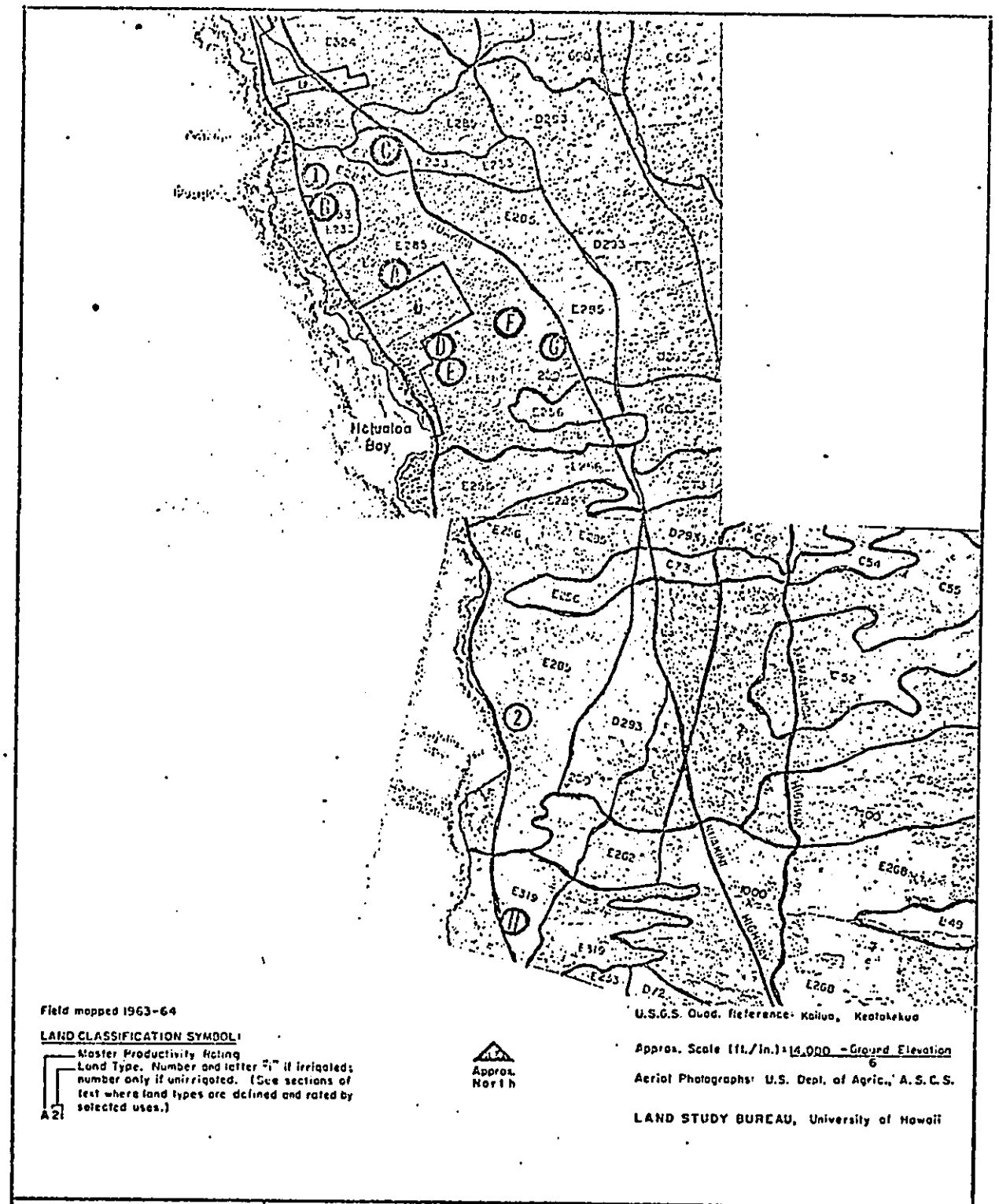


FIGURE 45	AGRICULTURAL LAND CLASSIFICATION

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

The numerical designation is used to identify the specific land type number. The land type number and their corresponding soil series for the above sites are as follows:

233 - Waiaha
285 - Pakini and Waiaha over Pahoehoe
319 - Bare Aa

Based on the above, all of the alternative sites have an "E" or very poor master productivity ratings for agriculture.

SOIL SURVEY

The soil survey map for the alternative sites is provided in Figure 46. The map was extracted from the December 1973 publication, "Soil Survey of Island of Hawaii, State of Hawaii", prepared by the United States Department of Agriculture Soil Conservation Service in cooperation with the University of Hawaii Agricultural Experiment Station. The alternative sites and their respective soil types are shown in Table 15.

TABLE 15
SOIL TYPE

Site	Soil Type
A	rPYD
B	WHC
C	WHC
D	WHC
E	WHC
F	rPYD
G	rPYD
H	rLV
1	rPYD
2	rPYD

The three types of soils and their physical properties are tabulated in Table 16. The information will be used in the evaluation of the alternative sites.

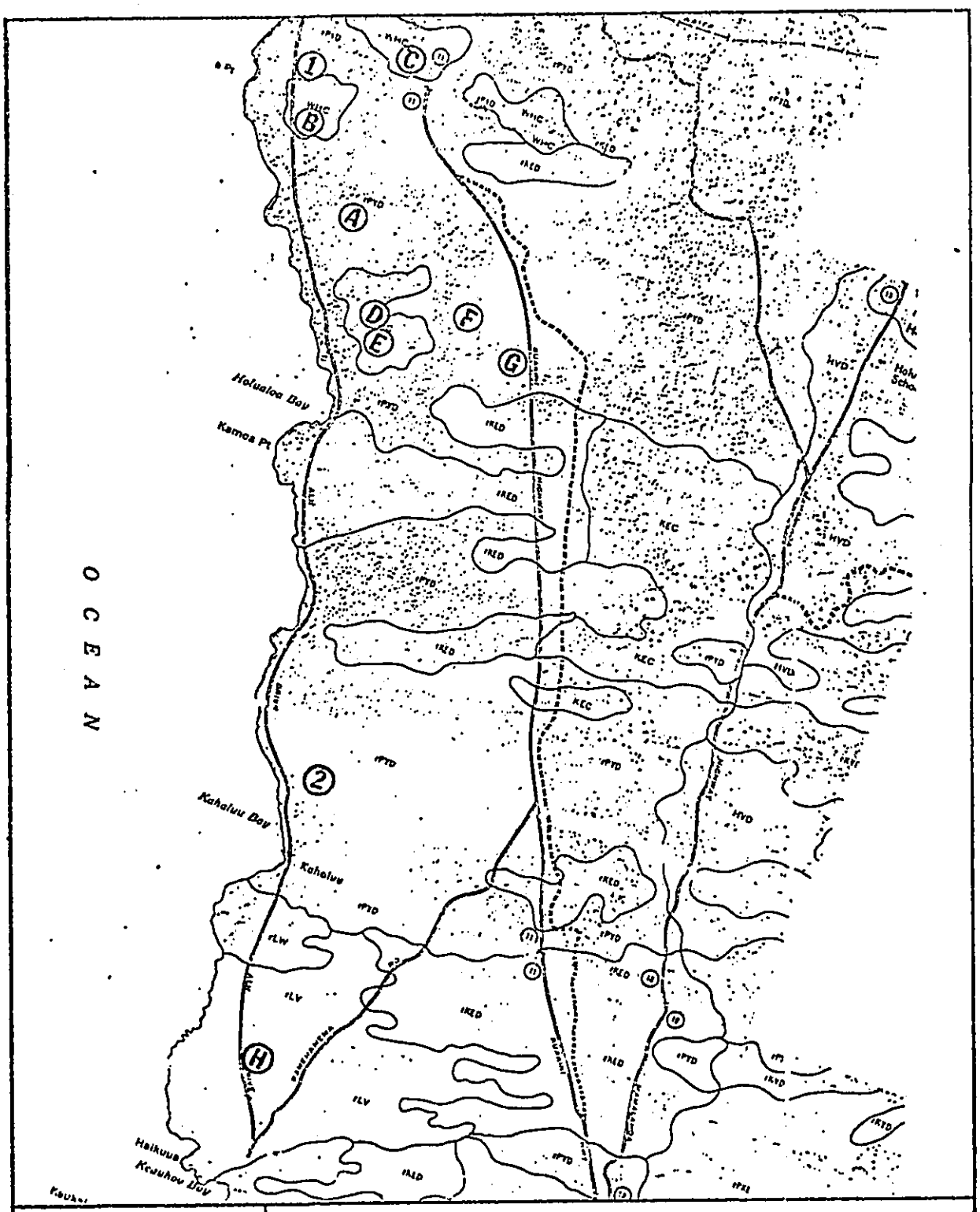


FIGURE 46	SOIL SURVEY MAP
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH

TABLE 16
SOIL SURVEY ENGINEERING INTERPRETATIONS

Soil Series and Map Symbols	Suitability As Source Of		Soil Features Affecting						Degree and Kind of Limitation for Septic Tank Filter Fields
	Top Soil	Road Fill	Highway Location	Farm Ponds: Reservoir	Farm Ponds: Embankment	Terraces and Diversions	Grassed Waterways	Foundations for Low Buildings	
Lava flows, Aa: rLV	—	Good in fragmental surface layer.	Aa lava	Aa lava	—	—	—	Aa lava	Severe - Aa lava lava
Punaluu: rPVD	Poor - Pahoehoe lava at depth of less than 10 inches.	Poor - Pahoehoe lava at depth of less than 10 inches.	Pahoehoe lava at depth of less than 10 inches.	Pahoehoe lava at depth of less than 10 inches.	Pahoehoe lava at depth of less than 10 inches.	—	—	Pahoehoe lava at depth of less than 10 inches.	Severe - Pahoehoe lava at depth of less than 10 inches.
Waiaha: WIC	Poor - Stoniness; bedrock at depth of less than 1-1/2. feet.	Fair - Bedrock at depth of less than 1-1/2 feet; high erodibility.	Bedrock at depth of less than 1-1/2 feet; unstable slopes; high erodibility.	High seepage loss.	Limited volume of material; stoniness; unstable slopes; high erodibility; subject to piping.	Bedrock at depth of less than 1-1/2 feet; stoniness; high erodibility; unstable slopes.	Bedrock at depth of less than 1-1/2 feet; stoniness; high erodibility.	Bedrock at depth of less than 1-1/2 feet.	Severe - Bedrock at depth of less than 1-1/2 feet.

SOURCE: Soil Survey of Island of Hawaii, USDA Soil Conservation Service, December 1973.

CHAPTER 4
EVALUATION OF ALTERNATIVE SITES

PROCEDURE

The alternative sites selected in Chapter 2 were evaluated against the Site Evaluation Criteria contained in Appendix A. The alternative sites were first evaluated for compliance with the minimum site criteria. Those sites which did not meet the minimum criteria were eliminated from further consideration. The alternative sites which satisfied the minimum criteria were then evaluated against the school site criteria and the community site criteria. The cost considerations for these sites were then computed for comparison.

MINIMUM SITE CRITERIA

Evaluation of the alternative sites against the minimum site criteria is shown in Table 17. This evaluation shows that all of the alternative sites met the minimum criteria and should therefore be evaluated against the school site criteria and community site criteria.

SCHOOL AND COMMUNITY SITE CRITERIA

The alternative sites were evaluated against the School Site Criteria and Community Site Criteria contained in Appendix A and the results tabulated for each site in Tables 18 through 27. These ratings are based on the existing site conditions at the time of the evaluation.

COST CONSIDERATIONS

A major consideration in any site selection study is the relative costs associated with land acquisition, on and off-site developments, and bus subsidy of each alternative site. These cost factors are evaluated independently from the school and community site criteria ratings because the school and community criteria include general cost factors. For example, a particular site may have been rated "poor" based on lack of water service. However, the inclusion of a cost item for construction of a new waterline to the site does not result in a corresponding improvement to the original "poor" site rating. The costs for development of the alternative sites are considered as follows:

A. Land Acquisition

Land acquisition costs for the alternative sites are based on an appraisal report[1/] prepared by the State

1/ "Appraisal Report of Eight (8) Alternative Sites for Proposed Kailua-Keauhou Elementary School, Kona, Hawaii" by Ray S. Fukumoto, Property Valuation Analyst, Property Technical Office, Department of Taxation, June 1976.

TABLE 17
MINIMUM SITE CRITERIA EVALUATION

Minimum Site Criteria	Alternative Site									
	A	B	C	D	E	F	G	H	1	2
Size, Acres (7 acres minimum size)	7	7	7	7	7	7	7	7	7	7
Shape (maximum ratio 2.5:1)	1.9:1	1.0:1	1.2:1	1.1:1	1.5:1	1.2:1	1.2:1	1.5:1	1.2:1	1.2:1
Tsunami (outside inundation limit)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flood (outside flood plain)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Landslide (outside potential area)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Traffic (not in hazardous location)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Timing (acquisition/construction by 1980)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location (within service area)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Displacement (less than 10 families)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Preservation (no destruction of historical)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Conservation (outside district)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 18
EVALUATION OF ALTERNATIVE SITE A

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 2%.	G
3. Shape	Length-width ratio 1.9:1.0.	F
4. Foundation	Lava at depth of less than 10 inches.	G
5. Soil	Lava at depth of less than 10 inches.	P
6. Contours	Site slope is 3% or less.	G
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Site requires roadway for access.	P
2. Water	Waterline extension required.	P
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Extension of services required.	P
C. Accessibility		
1. Pedestrian	Accessible from two sides.	F
2. Automobile	Roadway along two sides.	G
3. Bus Service	No bus service.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Adjacent to proposed Alii Highway.	P
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	No nuisances anticipated.	G
5. Attractive Nuisances	0.3 mile from commercial property.	F
	SCHOOL SUMMARY: GOOD (G)	7
	FAIR (F)	8
	POOR (P)	7

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Alternate Urban	F
3. County Zoning	Unplanned	F
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	Less than 50% walking.	P
	COMMUNITY SUMMARY: GOOD (G)	6
	FAIR (F)	3
	POOR (P)	2

TABLE 19
EVALUATION OF ALTERNATIVE SITE B

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 4%.	F
3. Shape	Length-width ratio 1.0:1.	G
4. Foundation	Bedrock at depth of 1-1/2 feet.	G
5. Soil	Stoniness, bedrock at 1-1/2 feet.	P
6. Contours	Within 22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Existing Alii Drive adequate.	G
2. Water	Improvements to existing waterline.	F
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Existing services available.	G
C. Accessibility		
1. Pedestrian	Accessible from two sides.	F
2. Automobile	Roadway along two sides.	G
3. Bus Service	No bus service.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Over 500 feet from Alii Highway.	F
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	No nuisances anticipated.	G
5. Attractive Nuisances	More than 0.5 mile from commercial property.	G
	SCHOOL SUMMARY: GOOD (G)	9
	FAIR (F)	10
	POOR (P)	3

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Resort	P
3. County Zoning	Unplanned	P
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	Less than 50% walking.	P
	COMMUNITY SUMMARY: GOOD (G)	6
	FAIR (F)	2
	POOR (P)	3

TABLE 20
EVALUATION OF ALTERNATIVE SITE C

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 6%.	F
3. Shape	Length-width ratio 1.2:1.	G
4. Foundation	Bedrock at depth of 1-1/2 feet.	G
5. Soil	Stoniness, bedrock at 1-1/2 feet.	P
6. Contours	Within 22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Existing Kuakini Highway adequate.	G
2. Water	Existing 8" line adequate.	G
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Existing services available.	G
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one short side.	P
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access from future through street.	F
5. Pedestrian Safety	Pedestrian overpass required.	P
D. Environment		
1. Highway Noise	Adjacent to Kuakini Highway.	P
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	No nuisances anticipated.	G
5. Attractive Nuisances	0.4 mile from commercial property.	F

SCHOOL SUMMARY:		
	GOOD (G)	7
	FAIR (F)	8
	POOR (P)	7

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Alternate Urban	F
3. County Zoning	Unplanned	F
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	Less than 50% walking.	P

COMMUNITY SUMMARY:		
	GOOD (G)	6
	FAIR (F)	3
	POOR (P)	2

TABLE 21
EVALUATION OF ALTERNATIVE SITE D

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 6%.	F
3. Shape	Length-width ratio 1.1:1.	G
4. Foundation	Bedrock at depth of 1-1/2 feet.	G
5. Soil	Stoniness, bedrock at 1-1/2 feet.	P
6. Contours	22.5° of N-S.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Requires roadway for access.	P
2. Water	Waterline extension required.	P
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Will require channel improvements.	P
5. Power and Communications	Extension of services required.	P
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one long side.	F
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Adjacent to proposed Alii Highway.	P
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	Adjacent to concrete plant.	P
5. Attractive Nuisances	Within 0.25 mile of commercial property.	P

SCHOOL SUMMARY:		
	GOOD (G)	4
	FAIR (F)	7
	POOR (P)	11

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Low Density Residential	G
3. County Zoning	RS-7.5 and Unplanned	G
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	Two owners.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	50% within walking distance.	F

COMMUNITY SUMMARY:		
	GOOD (G)	8
	FAIR (F)	2
	POOR (P)	1

TABLE 22
EVALUATION OF ALTERNATIVE SITE E

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 5%.	F
3. Shape	Length-width ratio 1.5:1.	G
4. Foundation	Bedrock at depth of 1-1/2 feet.	G
5. Soil	Stoniness, bedrock at 1-1/2 feet.	P
6. Contours	22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Requires roadway for access.	P
2. Water	Waterline extension required.	P
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Extension of services required.	P
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one short side.	P
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Adjacent to proposed Alii Highway.	P
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	Adjacent to concrete plant.	P
5. Attractive Nuisances	Within 0.25 mile of commercial property.	P

SCHOOL SUMMARY: GOOD (G) 4; FAIR (F) 7; POOR (P) 11

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Agriculture District	P
2. County General Plan	Extensive Agriculture	P
3. County Zoning	Unplanned	F
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	50% within walking distance.	F

COMMUNITY SUMMARY: GOOD (G) 5; FAIR (F) 3; POOR (P) 3

TABLE 23
EVALUATION OF ALTERNATIVE SITE F

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 8%.	F
3. Shape	Length-width ratio 1.2:1.	G
4. Foundation	Lava at depth of less than 10 inches.	G
5. Soil	Lava at depth of less than 10 inches.	P
6. Contours	22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Some roadway improvement required.	F
2. Water	Existing 8-inch main.	G
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Existing services available.	G
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one short side.	P
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access via dead end street.	P
5. Pedestrian Safety	Pedestrian overpass required.	P
D. Environment		
1. Highway Noise	900 feet from Kuakini Highway.	F
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	None anticipated.	G
5. Attractive Nuisances	0.3 mile from commercial property.	F
	SCHOOL SUMMARY: GOOD (G)	6
	FAIR (F)	9
	POOR (P)	7

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Low Density Residential	G
3. County Zoning	RS-10 and 15	G
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	May partially obstruct vista.	F
8. Location	50% within walking distance.	F
	COMMUNITY SUMMARY: GOOD (G)	7
	FAIR (F)	3
	POOR (P)	1

TABLE 24
EVALUATION OF ALTERNATIVE SITE G

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 7%.	F
3. Shape	Length-width ratio 1.2:1.	G
4. Foundation	Lava at depth of less than 10 inches.	G
5. Soil	Lava at depth of less than 10 inches.	P
6. Contours	22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Existing subdivision road.	G
2. Water	Existing 8-inch main.	G
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Existing services available.	G
C. Accessibility		
1. Pedestrian	Accessible from two sides.	F
2. Automobile	Roadway along one short side.	P
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Pedestrian overpass required.	P
D. Environment		
1. Highway Noise	Adjacent to Kuakini Highway.	P
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	None anticipated.	G
5. Attractive Nuisances	Within 0.25 mile of commercial property.	P
	SCHOOL SUMMARY: GOOD (G)	8
	FAIR (F)	7
	POOR (P)	7

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Low Density Residential	G
3. County Zoning	RS-15	G
B. Community Effects		
1. Displacement	Less than five families or businesses.	F
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Residence and/or business.	P
5. Traffic	Less than 60% workbound.	P
6. Land Owners	Two owners.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	50% within walking distance.	F
	COMMUNITY SUMMARY: GOOD (G)	6
	FAIR (F)	3
	POOR (P)	2

TABLE 25
EVALUATION OF ALTERNATIVE SITE H

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 8%.	F
3. Shape	Length-width ratio 1.5:1.	G
4. Foundation	Aa Lava	G
5. Soil	Aa Lava	P
6. Contours	22.5° of NW-SE.	F
7. Aesthetic Value	Rock formations and golf course view.	G
B. Roadway and Utilities		
1. Roadway	Existing Alii Highway.	G
2. Water	Existing 12-inch main.	G
3. Sewer	Existing sewer system.	G
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Existing services available.	G
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one short side.	P
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Adjacent to Alii Highway.	P
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	None anticipated.	G
5. Attractive Nuisances	Within 0.25 mile of commercial property.	P
	SCHOOL SUMMARY: GOOD (G)	10
	FAIR (F)	6
	POOR (P)	6

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Medium Density Residential	G
3. County Zoning	RM-2	G
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	May partially obstruct vista.	F
8. Location	Less than 50% walking.	P
	COMMUNITY SUMMARY: GOOD (G)	7
	FAIR (F)	2
	POOR (P)	2

TABLE 26
EVALUATION OF ALTERNATIVE SITE 1

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 4%.	F
3. Shape	Length-width ratio 1.2:1.	G
4. Foundation	Lava at depth of less than 10 inches.	G
5. Soil	Lava at depth of less than 10 inches.	P
6. Contours	Within 22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Existing Alii Drive adequate.	G
2. Water	Improvements to existing waterline.	F
3. Sewer	Cesspools or treatment plant required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Existing services available.	G
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one long side.	F
3. Bus Service	No bus service.	P
4. Traffic Safety	Access from major roadway.	G
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Over 500 feet from Alii Highway.	F
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	No nuisances anticipated.	G
5. Attractive Nuisances	More than 0.5 mile from commercial property.	G

SCHOOL SUMMARY:		
	GOOD (G)	8
	FAIR (F)	10
	POOR (P)	4

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Resort	P
3. County Zoning	Unplanned	F
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	Less than 50% walking.	P

COMMUNITY SUMMARY:		
	GOOD (G)	6
	FAIR (F)	2
	POOR (P)	3

TABLE 27
EVALUATION OF ALTERNATIVE SITE 2

SCHOOL SITE CRITERIA

CRITERIA	EVALUATION	RATING
A. Site Characteristics		
1. Size	Requested 7-acre size.	F
2. Slope	Averages 8%.	F
3. Shape	Length-width ratio 1.2:1.	G
4. Foundation	Lava at depth of less than 10 inches.	G
5. Soil	Lava at depth of less than 10 inches.	P
6. Contours	22.5° of NW-SE.	F
7. Aesthetic Value	Some trees and rock formations.	F
B. Roadway and Utilities		
1. Roadway	Requires roadway for access.	P
2. Water	Waterline extension required.	P
3. Sewer	Sewer line extension required.	P
4. Drainage	Drainage system to be provided.	F
5. Power and Communications	Extension of services required.	P
C. Accessibility		
1. Pedestrian	Accessible from one side.	P
2. Automobile	Roadway along one short side.	P
3. Bus Service	No bus service available.	P
4. Traffic Safety	Access from future through street.	F
5. Pedestrian Safety	Walkways will be provided.	F
D. Environment		
1. Highway Noise	Approximately 700 feet from Alii Highway.	F
2. Aircraft Noise	More than one mile from Keahole.	G
3. Rainfall	Between 30" and 40" M.A.R.	F
4. Indus. and Agri. Nuisances	None anticipated.	G
5. Attractive Nuisances	More than 0.5 mile from commercial property.	G

SCHOOL SUMMARY:		
	GOOD (G)	5
	FAIR (F)	9
	POOR (P)	8

COMMUNITY SITE CRITERIA

A. Government		
1. State Land Use	Urban District	G
2. County General Plan	Low Density Residential	G
3. County Zoning	RS-7.5	G
B. Community Effects		
1. Displacement	Vacant site.	G
2. Interference w/Institutions	None anticipated.	G
3. Agriculture	Very poor (E) productivity.	G
4. Existing Use	Vacant site.	G
5. Traffic	Less than 60% workbound.	P
6. Land Owners	One owner.	F
7. Natural Beauty	Not aesthetic asset.	G
8. Location	Less than 50% walking.	P

COMMUNITY SUMMARY:		
	GOOD (G)	8
	FAIR (F)	1
	POOR (P)	2

Department of Taxation as summarized in Appendix B. Besides this appraised value which considers the land and improvements for each site, additional acquisition costs required are estimated as follows:

1. Appraisal Report - $2,000 plus $500 for each lot.

2. Title Search - $1,000 per lot.

3. Tenant Relocation - $5,000 for each family, farm, or business.

4. Administration - $2,000 plus $500 per displacee.

The total estimated land acquisition cost for the alternative sites are tabulated in Table 28.

TABLE 28
SUMMARY OF LAND ACQUISITION COSTS a/

Item	Alternative Sites and Cost ($1,000)									
	A	B	C	D	E	F	G	H	1	2
Land Cost	164.5	308	164.5	192.5	147	189	183	1,190	308	192.5
Appraisal	2.5	2.5	2.5	2.5	2.5	2.5	3.0	2.5	2.5	2.5
Title Search	1	1	1	1	1	1	2	1	1	1
Tenant Relocation	0	0	0	0	0	0	5	0	0	0
Administration	2	2	2	2	2	2	2.5	2	2	2
Total ($1,000)	170.0	313.5	170.0	198.0	152.5	194.5	195.5	1,195.5	313.5	198.0

a/ See Appendix B for computations.

B. On-Site Development

Each alternative site will require certain on-site developments which are peculiar to that site. To account for these differences and their cost, the following items were considered in the cost analysis:

1. Grading - Cost of grading necessary to adapt the existing topographic features for buildings, play areas, and other facilities.

2. Utilities - Additional costs of making utility connections, viz. water and sewer, due to adverse conditions.

3. Drainage - Cost of constructing major drainage facilities (lined channels, large culverts, etc.) if site is in a flood plain.

4. Foundation - Additional foundation cost due to adverse subsurface conditions.

5. Clearing - Cost of removing existing structures and heavy foilage.

6. Soundproofing - Cost of soundproofing classrooms if predicted traffic noise will exceed 55 dBA inside the classroom.

Detailed computations for the above items are contained in Appendix B for each alternative site and the results tabulated in Table 29.

TABLE 29
SUMMARY OF ON-SITE DEVELOPMENT COSTS a/

Item	Alternative Sites and Cost ($1,000)									
	A	B	C	D	E	F	G	H	1	2
Grading	189	241.5	297.5	269.5	269.5	322	269.5	525.	241.5	322
Water	-	-	-	-	-	-	-	-	-	-
Sewer	222	222	222	222	222	222	222	-	222	-
Power & Communications	-	-	-	-	-	-	-	-	-	-
Drainage	-	-	-	-	-	-	-	-	-	-
Soundproofing	-	-	568.5	-	-	-	568.5	-	-	-
Foundation	-	-	-	-	-	-	-	-	-	-
Clearing	10.5	10.5	10.5	10.5	10.5	10.5	11.5	4.2	10.5	10.5
Total ($1,000)	421.5	474.0	1,098.5	502.0	502.0	554.5	1,071.5	529.2	474.0	332.5

a/ See Appendix B for computations.

C. Off-Site Development

The following cost items are included in the off-site development costs:

1. Utilities - Cost of providing additional lines or increasing sizes due to additional loads imposed by the school.

2. Drainage - Cost of constructing additional drainage facilities to accommodate the proposed runoff quantity and pattern of the school.

3. Access Roads - Cost of constructing necessary access roadways to the site if none are available.

4. Pedestrian Overpass - The cost of constructing an overpass to provide safe pedestrian access to the school.

The detailed cost computations for the above items are computed for each alternative site in Appendix B and the results tabulated in Table 30.

TABLE 30
SUMMARY OF OFF-SITE DEVELOPMENT COSTS a/

Item	Alternative Sites and Cost ($1,000)									
	A	B	C	D	E	F	G	H	1	2
Water	54	96	-	36	51	-	-	-	96	129
Sewer	-	-	-	-	-	-	-	-	-	200
Power & Communications	18	-	-	12	17	-	-	-	-	8
Drainage	-	-	-	225	-	-	-	-	-	-
Access Roads	283	-	370	234	299	94	-	-	-	182
Pedestrian Overpass	-	-	250	-	-	250	250	-	-	-
Total ($1,000)	355	96	620	507	367	344	250	0	96	519

a/ See Appendix B for computations.

D. Bus Subsidy

A bus subsidy is provided by the Department of Education for students residing more than one mile (road distance) away from school. Since the alternative sites will have different numbers of students qualifying for the bus subsidy, the cost of this subsidy is computed for each alternative site. For purposes of this study, the costs of the bussing subsidies were computed for a 20-year period as shown in Appendix B and the results summarized in Table 31.

TABLE 31
SUMMARY OF BUS SUBSIDY COST

Site	Present Worth of 20-Year Cost
A	$646,000
B	$754,000
C	$789,000
D	$546,000
E	$521,000
F	$462,000
G	$489,000
H	$828,000
1	$794,000
2	$903,000

ANALYSIS

The evaluation results for all of the alternative sites are summarized in Table 32 and the cost considerations are

TABLE 32
EVALUATION SUMMARY

Evaluation Criteria	A	B	C	D	E	F	G	H	1	2
SCHOOL SITE CRITERIA										
A. Site Characteristics										
1. Size	F	F	F	F	F	F	F	F	F	F
2. Slope	G	F	F	F	F	F	F	F	F	F
3. Shape	F	G	G	G	G	G	G	G	G	G
4. Foundation	G	G	G	G	G	G	G	G	G	G
5. Soil	P	P	P	P	P	P	P	P	P	P
6. Contours	G	F	F	F	F	F	F	F	F	F
7. Aesthetic Value	F	F	F	F	F	F	F	G	F	F
B. Roadway and Utilities										
1. Roadway	P	G	G	P	P	F	G	G	G	P
2. Water	P	F	G	P	P	G	G	G	F	P
3. Sewer	P	P	P	P	P	P	P	G	P	P
4. Drainage	F	F	F	P	F	F	F	F	F	F
5. Power and Communications	P	G	G	P	P	G	G	G	G	P
C. Accessibility										
1. Pedestrian Access	F	F	P	P	P	P	F	P	P	P
2. Automobile Access	G	G	P	F	P	P	P	P	F	P
3. Bus Service	P	P	P	P	P	P	P	P	P	P
4. Traffic Safety	G	G	F	G	G	P	G	G	G	F
5. Pedestrian Safety	F	F	P	F	F	P	P	F	F	F
D. Environment										
1. Highway Noise	P	F	P	P	P	F	P	P	F	F
2. Aircraft Noise	G	G	G	G	G	G	G	G	G	G
3. Rainfall	F	F	F	F	F	F	F	F	F	F
4. Indus. and Agri. Nuisances	G	G	G	P	P	G	G	G	G	G
5. Attractive Nuisances	F	G	F	P	P	F	P	P	G	G
SCHOOL SUMMARY: GOOD (G)	7	9	7	4	4	6	8	10	8	5
FAIR (F)	8	10	8	7	7	9	7	6	10	9
POOR (P)	7	3	7	11	11	7	7	6	4	8
COMMUNITY SITE CRITERIA										
A. Government										
1. State Land Use	G	G	G	G	P	G	G	G	G	G
2. County General Plan	F	P	F	G	P	G	G	G	P	G
3. County Zoning	F	F	F	G	F	G	G	G	F	G
B. Community Effects										
1. Displacement	G	G	G	G	G	G	F	G	G	G
2. Interference w/Institutions	G	G	G	G	G	G	G	G	G	G
3. Agriculture	G	G	G	G	G	G	G	G	G	G
4. Existing Use	G	G	G	G	G	G	P	G	G	G
5. Traffic	P	P	P	P	P	P	P	P	P	P
6. Land Owners	F	F	F	F	F	F	F	F	F	F
7. Natural Beauty	G	G	G	G	G	F	G	F	G	G
8. Location	P	P	P	F	F	F	F	P	P	P
COMMUNITY SUMMARY: GOOD (G)	6	6	6	8	5	7	6	7	6	8
FAIR (F)	3	2	3	2	3	3	3	2	2	1
POOR (P)	2	3	2	1	3	1	2	2	3	2

summarized in Table 33. Site B has the best rating in terms of School Site Criteria, followed fairly close by Site H and Site 1 which are rated equal. In terms of Community Site Criteria, Site D has the best rating and is followed closely by Site F and Site 2 which are rated equal.

TABLE 33
COMPARATIVE COST SUMMARY

Item	Alternative Sites and Cost									
	A	B	C	D	E	F	G	H	1	2
Land Acquisition	170	313.5	170	198	152.5	194.5	195.5	1,195.5	313.5	198
On-Site Develop.	421.5	474	1,098.5	502	502	554.5	1,071.5	529.2	474	332.5
Off-Site Develop.	355	96	620	507	367	344	250	0	96	519
Bussing Subsidy	646	754	789	546	521	462	489	828	794	903
Total Cost ($1,000)	1,592.5	1,637.5	2,677.5	1,753.0	1,542.5	1,555.0	2,006.0	2,552.7	1,677.5	1,952.5

The Comparative Cost in Table 33 for the alternative sites shows that Alternative Site E has the least comparative cost followed by Site F, A, B, and 1. Since cost is a major factor in the selection of a site, Sites C, D, G, H, and 2 which have the highest comparative cost were eliminated from further consideration. The comparative cost for these sites ranged from $210,000 to $1,135,000 more than that for Site E.

The remaining sites: A, B, E, F, and 1 were re-evaluated in Table 34 on the basis that the improvements indicated in Table 33 were implemented. The results were:

1. Site B still had the highest rating followed by Site 1 in terms of School Site Criteria. However, Site A was now rated equal to Site 1.

2. Site F still had the highest rating for Community Site Criteria followed by Site A and then by Sites B and 1 which are equal and Site E.

3. Since the school and community site criteria ratings for Site E were substantially below those for the other sites, this site was dropped from further consideration.

It should be noted that the off-site costs of $337,000 for Site A, $96,000 for Site B, $0 for Site F, and $96,000 for Site 1 will be for roadway and waterline improvements that are normally provided by the County.

Since the review comments from governmental agencies, community groups, and property owners must also be considered

TABLE 34
COMPARISON OF DIFFERENCES WITH IMPROVED RATINGS

SCHOOL SITE CRITERIA	Alternative Sites A	B	E	F	1
A. Site Characteristics					
1. Size	P	F	F	F	F
2. Slope*	G	G	G	G	G
3. Shape	F	G	G	G	G
4. Foundation	G	G	G	G	G
5. Soil	P	P	P	P	P
6. Contours	G	F	F	F	F
7. Aesthetic Value	F	F	F	F	F
B. Roadway and Utilities					
1. Roadway*	G	G	G	G	G
2. Water*	G	G	G	G	G
3. Sewer*	G	G	G	G	G
4. Drainage*	G	G	G	G	G
5. Power and Communications*	G	G	G	G	G
C. Accessibility					
1. Pedestrian Access	F	F	P	P	P
2. Automobile Access	G	G	P	P	P
3. Bus Service	P	P	P	P	P
4. Traffic Safety	G	G	G	P	G
5. Pedestrian Safety*	F	F	F	F	F
D. Environment					
1. Highway Noise	P	F	P	F	F
2. Aircraft Noise	G	G	G	G	G
3. Rainfall	F	F	F	F	F
4. Indus. and Agri. Nuisances	G	G	P	G	G
5. Attractive Nuisances	F	G	P	F	G
SCHOOL SUMMARY: GOOD (G)	12	13	10	10	12
FAIR (F)	7	7	5	7	7
POOR (P)	3	2	7	5	3

COMMUNITY SITE CRITERIA	Alternative Sites A	B	E	F	1
A. Government					
1. State Land Use	G	G	P	G	G
2. County General Plan	F	P	P	G	P
3. County Zoning	F	F	F	G	F
B. Community Effects					
1. Displacement	G	G	G	G	G
2. Interference w/Institutions	G	G	G	G	G
3. Agriculture	G	G	G	G	G
4. Existing Use	G	G	G	G	G
5. Traffic	P	P	P	P	P
6. Land Owners	F	F	F	F	F
7. Natural Beauty	G	G	G	F	G
8. Location	P	P	F	F	P
COMMUNITY SUMMARY: GOOD (G)	6	6	5	7	6
FAIR (F)	3	2	3	3	2
POOR (P)	2	3	3	1	3
TOTAL: GOOD (G)	18	19	15	17	18
FAIR (F)	10	9	8	10	9
POOR (P)	5	5	10	6	6

* Denotes improved rating.

in the evaluation process, the following pertinent comments received during the consultation phase of this study are provided:

1. State Department of Education - Prefers Site C for climatic reasons. However, an evaluation of the climatic differences shows a maximum 1° F estimated temperature difference between the alternative sites.

2. State Department of Health - Expressed several environmental health concerns which should be considered for all sites.

3. State Department of Land and Natural Resources - Suggested that water supply, drainage, and erosion concerns for the sites be considered.

4. State Historic Preservation Officer - Concurred with the need for an archaeological survey of the selected site. A survey of the "best" sites is included in Appendix III of the EIS. A discussion of the survey results and the recommendations of the archaeologist is included in the EIS.

5. Office of Environmental Quality Control - Raised questions on the enrollment, location, access, environment, bussing, and EIS.

6. State Department of Planning and Economic Development - Suggested that the final EIS assess impacts peculiar to the chosen site.

7. State Department of Transportation - Expressed concern on the traffic hazards and potential traffic noise at Sites C and G. Considers Site B favorable.

8. County Department of Parks and Recreation - Supports the acquisition of additional acreage for a school-park site.

9. County Planning Department - Provided clarification on the zoning and General Plan requirements for the alternative sites.

10. County Department of Public Works - Requested additional explanation of the roadway and accessibility criteria used in the site evaluation. Also provided updated schedule for improvements to Alii Drive.

11. Kamehameha Development Corporation - Expressed concern that Site H is too close to resort activities.

12. B. P. Bishop Estate - Proposed an alternative site in Kahaluu in lieu of Site H.

13. John K. Collins/Winona Wong - Indicated they have no plans for the property and it is available.

14. Kobayashi Development and Construction - Expressed concern over the selection of two Alternative Sites A and B within their proposed development area. Requested that the final site selection be expedited to assist in their development plans.

15. Chiaki Matsuo - Indicated no plans for Site C and would cooperate with the school development.

APPENDIX A

SITE EVALUATION CRITERIA

SITE EVALUATION CRITERIA

GENERAL

Criteria for this school were established as ideal standards with which to evaluate each of the alternative sites. All prospective school sites, however, should meet certain minimum criteria as established by the Department of Education (DOE) and the Department of Accounting and General Services (DAGS). Sites not meeting the minimum criteria will be eliminated from further consideration unless they are shown on the County General Plan.

Only sites meeting the minimum site criteria and sites designated on the County General Plan will be evaluated against the school and community site criteria. The school and community site criteria ratings will be considered in the analysis and recommendation of a specific school site.

MINIMUM SITE CRITERIA

A. Size: The site must contain enough usable land to meet the following DOE minimum requirements:

ACREAGE REQUIREMENTS
FOR NEW SCHOOLS

			Acreage				
	Type	Enrollment	Playfields	Buildings & Open Space	Parking	Set Backs	Total
MINIMUM	Elem.	400	2½	1	½	1	5
	Inter.	400	3½	1½	½	1½	7
	High	750	10	5	2	3	20
MAXIMUM	Elem.	1000	3½	2	1	1½	8
	Inter.	1200	5½	3½	1	2	12
	High	2000	12	9	5	4	30

Note 1 - Building and open space acreage assumes finger type construction, and one and two-story construction for elementary and intermediate schools, and one to three-story construction for high schools.

Note 2 - Totals assume all acreage is usable with slopes not to exceed 9 percent.

Note 3 - Acreage requirements for enrollment between Minimum and Maximum:

Elementary - 1 acre per 300* students in excess of 400
Intermediate - 1 acre per 250* students in excess of 400
High - 1 acre per 150* students in excess of 750

Note 4 - If a school adjoins a county park, up to 50% of the playfield requirement may be satisfied by joint use agreement permitting DOE priority use of designated park facilities during school hours.

*(or fraction thereof)

B. Shape: The length to width ratio of the site must not exceed 2.5 to 1. Higher length-width ratios severely restrict the design flexibility of the complex and placement of facilities in their optimum arrangement.

C. Tsunami: The site must not be in a tsunami inundation zone as established by the Tsunami Research Center of the Hawaii Institute of Geophysics.

D. Flood: The site must not be in a major flood plain exposed to excessive storm water runoff if adequate drainage provisions, i.e. culverts, lined channels, etc., cannot be made at a reasonable cost.

E. Landslide: The site must not be located within a known or potential landslide area.

F. Traffic: The site must not be located in an area hazardous from the standpoint of pedestrian and traffic safety unless adequate safety provisions can be made.

G. Timing: The acquisition of the site must be possible early enough to allow enough construction time to meet DOE's scheduled school opening date.

H. Location: The site must be within the ultimate service area.

I. Displacement: The site must be obtained without the relocation of ten or more families.

J. Preservation: The development must be such that no historic, cultural, or scenic buildings or sites will be destroyed.

K. Conservation: The site must not be located in a State Land Use Conservation District.

SCHOOL SITE CRITERIA

A. Site Characteristics

1. Size:

a. Good - The site is the minimum size because an adjacent park will be used to meet the school's playground requirements.

b. Fair - The site is the requested size.

c. Poor - The site is larger than the requested size because of slope or other considerations.

2. Slope: Computed by analyzing the overall slope of the site and taking an average.

   a. Good - The average slope of the site is between 1 and 3%.

   b. Fair - The average slope of the site is between 4 and 10%.

   c. Poor - The average slope of the site is greater than 10%.

3. Shape: The shape should generally be rectangular.

   a. Good - Length-width ratio 1.0:1.0 to 1.6:1.0.

   b. Fair - Length-width ratio 1.7:1.0 to 2.0:1.0.

   c. Poor - Length-width ratio 2.1:1.0 to 2.5:1.0.

4. Foundation: U.S.D.A. Soil Conservation Service Soil Survey of the Island of Hawaii.

   a. Good - Lava or bedrock at depth of less than 5 feet and/or favorable features.

   b. Fair - Moderate bearing capacity, moderate shrink-swell potential and/or compressibility.

   c. Poor - Subject to tidal action, low bearing capacity, high compressibility, low shear strength, high shrinkage, high organic-matter content.

5. Soil: U.S.D.A. Soil Conservation Service Soil Survey of Island of Hawaii.

   Refer to corresponding rating by U.S.D.A. Soil Survey for suitability as source of topsoil.

6. Contours: Alignment for ventilation and sun glare.

   a. Good - The alignment of the contours falls within 22.5° of the east-west direction or the slope is 3% or less.

   b. Fair - The alignment of the contours falls within 22.5° of the north-south or northwest-southeast direction.

   c. Poor - The alignment of the contours falls within 22.5° of the northeast-southwest direction.

7. Aesthetic Value:

a. Good - The site has some natural beauty in the form of trees, plants, rock formations, etc. which can be preserved and integrated into the school campus. The site is not crossed by overhead utility lines.

b. Fair - The site lacks most of the desirable natural beauty but still has the potential of becoming a beautiful campus through proper landscaping. The site is not crossed by overhead lines.

c. Poor - The site has no natural beauty whatsoever. The site is crossed by overhead lines.

B. Roadway and Utilities

1. Roadway:

a. Good - The site has adequate roadways to meet the ultimate school needs.

b. Fair - The site will have adequate roadways which will be developed or require some widening to serve the interim and ultimate needs of the school.

c. Poor - The site has no roadways and will require the construction of a roadway system to specifically meet the school needs.

2. Water:

a. Good - The site has adequate water pressure and capacity available to meet the ultimate school needs.

b. Fair - The existing water service is insufficient but adequate service is being developed which will meet the interim and ultimate needs of the school.

c. Poor - The site has inadequate water service and will require the development or extension of a water system to specifically meet the school needs.

3. Sewer:

a. Good - The site has adequate sewer lines available to meet the ultimate school needs.

b. Fair - The site will have adequate sewer service which is being developed to serve the interim and ultimate needs of the school.

c. Poor - The site has no sewer service and will require the construction of cesspools or a sewage treatment plant to meet the school needs.

4. Drainage:

a. Good - The site has adequate drainage facilities available to meet the ultimate school needs.

b. Fair - The site will have adequate drainage facilities which are being developed to serve the interim and ultimate needs of the school.

c. Poor - The site has no drainage facility and may require the development of a drainage system to specifically meet the school needs.

5. Power and Communications:

a. Good - The site has adequate existing power and communications available to meet the ultimate school needs.

b. Fair - The site will have adequate power and communications which are being developed to serve the interim and ultimate needs of the school.

c. Poor - The site has insufficient power or communications available and will require improvement on these services to serve the school needs.

C. Accessibility

1. Pedestrian:

a. Good - The site will have pedestrian access from three sides.

b. Fair - The site will have pedestrian access from two sides.

c. Poor - The site will have pedestrian access from only one side.

2. Automobile:

   a. Good - The site will have roadways along one short side and one long side.

   b. Fair - The site will have roadways along one long side or two short sides.

   c. Poor - The site will have a roadway only along one short side.

3. Bus Service:

   a. Good - The site is served by a major bus line running through the service area.

   b. Fair - A major bus line passes within reasonable (0.5 mile) distance of the site.

   c. Poor - No bus service is available.

4. Traffic Safety:

   a. Good - The site is off a major roadway passing through the service area.

   b. Fair - Access to the site is via a through street capable of handling the heavy traffic at school opening and closing hours.

   c. Poor - Access to the site is via a dead end street.

5. Pedestrian Safety:

   a. Good - Adequate and safe walkways/shoulders to the site are available.

   b. Fair - Safe walkways/shoulders to the site will be provided along the school access road.

   c. Poor - The site may require traffic signals and/or pedestrian overpasses in addition to walkway shoulder improvements.

D. Environment

1. Highway Noise:

Major Highway - A highway with posted speed limits of 35 mph or more.

Freeway - A controlled access highway with posted speed limits of 45 mph or more.

Truck Route - A roadway designated as such by the Department of Health.

The measured distance to be used in the application of the Highway Noise Criteria shall be the distance from the center of the traffic lane closest to the alternative site to the building setback line of the site.

a. Good - The site is more than 1,500 feet away from major highways, freeways and truck routes.

b. Fair - The site is 500 feet to 1,500 feet away from major highways, freeways and truck routes to keep the motor vehicular noise level down to a level where normal conversation can be heard.

c. Poor - The site is within 500 feet of a major highway, freeway or truck route.

2. Aircraft Noise:

a. Good - The site is more than a mile away from the normal aircraft flight patterns into and out of airports and air bases.

b. Fair - The site is far enough away (0.5 to 1 mile) from the normal flight patterns to keep the noise level down to a level where normal conversation can be heard.

c. Poor - The site is directly under (0 to 0.5 mile) the approach and takeoff patterns.

3. Rainfall:

a. Good - The site has a median annual rainfall less than 30".

b. Fair - The site has a median annual rainfall between 30" to 39.9".

c. Poor - The site has a median annual rainfall greater than 40".

4. Industrial and Agricultural Nuisances:

a. Good - The site is free from noise, dust, odors, smoke, and other nuisances created by industrial or agricultural activities.

b. Fair - The noise, dust, odors, smoke, etc., nuisances from industrial or agricultural activities are at worst periodic but well within the limits of human toleration.

c. Poor - The above mentioned nuisances cause considerable discomfort and hamper school activities.

5. Attractive Nuisances:

a. Good - The site is more than a half mile from those commercial enterprises (bowling alleys, pool halls, stores, etc.) that may attract students during school hours.

b. Fair - The site is reasonably far (0.25 to 0.5 mile) from distracting commercial centers.

c. Poor - The site is within a quarter mile of undesirable commercial enterprises.

COMMUNITY SITE CRITERIA

A. Government

1. State Land Use District Map:

a. Good - The site is within an Urban District.

b. Fair - The site is within a Rural District.

c. Poor - The site is in an Agricultural or Conservation District.

2. County General Plan:

a. Good - The site is designated for low or medium density residential.

b. Fair - The site is designated for alternate urban expansion.

c. Poor - The site is designated for resort, conservation, industrial, agricultural, or open space.

3. County Zoning:

a. Good - The site is zoned residential.

b. Fair - The site is zoned agricultural or unplanned.

c. Poor - The site is zoned hotel, commercial, resort-hotel, industrial, or open.

B. Community Effects

1. Displacement:

a. Good - The site may be acquired without relocating any family, farm, or business.

b. Fair - The site may be acquired without relocating any farm or business or more than five families and living units.

c. Poor - The site cannot be acquired without the relocation of farms, businesses, or more than five families.

2. Interference with Institutions:

a. Good - The site is greater than 0.5 mile from hospitals, rest homes, and any other institution which may be disturbed by large groups of students.

b. Fair - The site is far enough away (0.25 to 0.5 mile) from any hospital, rest home, etc., so that any disturbance to the institution by the activities of the school will be minimal.

c. Poor - The site is adjacent to a hospital, rest home, or similar institution which may be disturbed by the activities of the school.

3. Agriculture: University of Hawaii Land Study Bureau Agricultural Land Classification Productivity Rating.

a. Good - The site is located on land with very poor (E) productivity rating.

b. Fair - The site is located on land with fair (C) to poor (D) productivity rating.

c. Poor - The site is located on land with very good (A) to good (B) productivity rating.

4. Existing Use: In changing the existing use of the site to school use, there should be a minimum amount of disruption to the existing pattern of living of the community.

a. Good - The site is vacant and unused.

b. Fair - The site is being used for government agencies or institutions.

c. Poor - The site is being used for agriculture, residences or private businesses.

5. Traffic:

a. Good - The site is located such that 80% of the morning work-bound traffic from the service area coincides with the school-bound traffic.

b. Fair - The site is located such that 70% of the morning work-bound traffic from the service area coincides with the school-bound traffic.

c. Poor - The site is located such that less than 60% of the morning work-bound traffic from the service area coincides with the school-bound traffic.

6. Land Owners:

a. Good - The site is entirely owned by the Federal, State, or County government.

b. Fair - The site is owned by less than three individuals or business corporations.

c. Poor - The site is owned by three or more individuals or business corporations.

7. Natural Beauty:

a. Good - The site is not an aesthetic asset to the community and will not interfere with scenic vistas when it is developed into a school.

b. Fair - The site has little aesthetic value to the community or may partially obstruct scenic vistas when it is developed into a school.

c. Poor - The site is an aesthetic asset to the community or will obstruct scenic vistas when it is developed into a school.

8. Location:

a. Good - The site is within reasonable walking distance (0.75 mile) of 75% of the students.

b. Fair - The site is within reasonable walking distance of 50% of the students.

c. Poor - The site is within reasonable walking distance of less than 50% of the students.

APPENDIX B

COST COMPUTATIONS

Land Acquisition

On-Site Development

Off-Site Development

Bus Subsidy

LAND ACQUISITION COST

APPRAISAL

The following summary of salient facts and conclusions was prepared by the State Department of Taxation for the site selection study.

SUMMARY OF SALIENT FACTS AND CONCLUSIONS

Site	Tax Map Key Location	Land Area (Acs.)	State Land Use	General Plan	County Zoning	Highest and Best Use	Indicated Price Per Acre For Land	Market Value
A	7-5-20 por. 1 Proposed Alii Highway	10	Urban	Alternate Urban	Unplanned	Residential	$23,500	$235,000
B	7-5-20 por. 1 Alii Drive - Mauka	10	Urban	Resort	Unplanned	Multi-Family	$44,000	$440,000
C	7-5-19 por. 1 Kuakini Highway	10	Urban	Alternate Urban	Unplanned	Residential	$23,500	$235,000
D	7-6-13 por. 11 Proposed Alii Highway	10	Urban	Low Density	Residential (RS-7.5)	Residential	$27,500	$275,000
E	7-6-13 por. 9 Proposed Alii Highway	10	Agriculture	Extensive Agriculture	Unplanned	Potential Residential	$21,000	$210,000
F	7-6-13 por. 31 Off Kuakini Highway	10	Urban	Low Density	Residential (RS-10 & RS-15)	Residential	$27,000	$270,000
G	7-6-13-25 & por. 31 Kuakini Highway	10	Urban	Low Density	Residential (RS-15)	Residential	$26,000 $1,000 (Impr.)	$260,000 $1,000 (Impr.) $261,000 (Total)
H	7-4-10 por. 52 Alii Drive - Makai	10	Urban	Medium Density	Multi-Family (RM-2)	Multi-Family	$170,000	$1,700,000

SOURCE: Appraisal Report of Eight (8) Alternative Sites for Proposed Kailua-Keauhou Elementary School, Kona, Hawaii, by Ray S. Fukumoto, Property Valuation Analyst, Property Technical Office, Department of Taxation, June 1976.

Subsequent to the completion of the appraisal, the minimum school site size was reduced by the Department of Education from 10 to 7 acres and two additional sites were included in the study. A review of the pertinent data for Sites 1 and 2 showed that Site 1 was comparable to Site B, and Site 2 was comparable to Site D. Accordingly, the following estimated land values were computed based upon the above summary:

Site	Price Per Acre	Acreage	Cost
A	$23,500	7	$164,500
B	$44,000	7	$308,000
C	$23,500	7	$164,500
D	$27,500	7	$192,500
E	$21,000	7	$147,000
F	$27,000	7	$189,000
G	$26,000 Land $1,000 Improv.	7 7	$182,000 Land $1,000 Improv.
H	$170,000	7	$1,190,000
1	$44,000	7	$308,000
2	$27,500	7	$192,500

ON-SITE DEVELOPMENT COST

GRADING

The amount of grading work required for each potential school site will vary depending upon the site slope. For comparison, the estimated grading cost for each alternative site is computed as follows:

Site	Area	a/ Slope	b/ Quantity	c/ U/C	Cost ($1,000)
A	7 ac.	3%	18,900 cy.	$10/cy.	$189
B	7 ac.	5%	24,150 cy.	$10/cy.	$241.5
C	7 ac.	7%	29,750 cy.	$10/cy.	$297.5
D	7 ac.	6%	26,950 cy.	$10/cy.	$269.5
E	7 ac.	6%	26,950 cy.	$10/cy.	$269.5
F	7 ac.	8%	32,200 cy.	$10/cy.	$322
G	7 ac.	6%	26,950 cy.	$10/cy.	$269.5
H	7 ac.	9%	35,000 cy.	$15/cy.	$525
1	7 ac.	5%	24,150 cy.	$10/cy.	$241.5
2	7 ac.	8%	32,200 cy.	$10/cy.	$322

a/ Major slope computed by estimating the grade difference across the site and dividing by the distance across the site.
b/ Grading quantities based on previous school site grading quantities.
c/ Grading unit costs are assumed comparable for all sites except Site H which consists of Aa lava.

UTILITIES

The on-site utility costs may vary for each site and are computed for the following items:

(1) Water - For purposes of comparison, it is assumed that the on-site water system costs will be generally equal for all of the alternative sites. This assumption is based on comparable site conditions and water consumption requirements at each site.

(2) Sewer - None of the alternative sites except Sites H and 2 can be serviced by a sewer system. The County's proposed Kailua-Kona Sewerage System is based on preliminary plans and no schedule for implementation is available. Based on the above, it is assumed that a packaged-type sewage treatment plant will be required at each site except Sites H and 2. The estimated cost for the sewage system is computed as follows:

Initial Capital Cost:

Secondary Treatment Plant and Appurtenances = $150,000

Operating Costs: (Assume 20-year period)

Service Contract @ $300/month = $3,600 yr.
Assume: Interest = Escalation = 6%
Present Worth Operating Cost = 20 x $3,600 = $72,000

Total Sewage System Cost = $222,000 for all sites except Site H and Site 2.

(3) Power, Communications, and Gas - The on-site cost for these items will be approximately equal for all sites and the cost computations are therefore excluded for purposes of this study.

DRAINAGE

The on-site drainage system improvements required for each alternative site will be comparable in terms of cost. This is based on the relatively low (30" to 40") rainfall and the highly permeable soil conditions of the Kailua-Keauhou area. The on-site drainage will probably consist of swales, culverts, and pipes connected to dry wells.

FOUNDATION

All of the alternative sites have soils underlain with Aa or bedrock. Accordingly, no adverse subsurface conditions which will require additional foundation costs for school buildings are anticipated. Borings will be requird to verify the sub-surface conditions before construction.

CLEARING

The alternative sites have varying amounts of vegetation which will require clearing before construction. The estimated cost of clearing each site is computed as follows:

Site	Area	Work	Unit Cost	Cost
A	7 ac.	Clear trees	$1,500/ac.	$10,500
B	7 ac.	Clear trees	$1,500/ac.	$10,500
C	7 ac.	Clear trees	$1,500/ac.	$10,500
D	7 ac.	Clear trees	$1,500/ac.	$10,500
E	7 ac.	Clear trees	$1,500/ac.	$10,500
F	7 ac.	Clear trees	$1,500/ac.	$10,500
G	7 ac.	Clear trees Demolish Building	$1,500/ac. $1,000	$10,500 1,000 $11,500
H	7 ac.	Grub Brush	$600/ac.	$4,200
1	7 ac.	Clear trees	$1,500/ac.	$10,500
2	7 ac.	Clear trees	$1,500/ac.	$10,500

SOUNPROOFING

The alternative sites which have potential traffic noise problems will require remedial measures. Alternative Sites A, C, D, E, G, and H are adjacent to either Kuakini Highway or the proposed Alii Highway and will be subjected to traffic disturbances. The predicted noise level for sites along the proposed Alii Highway and Kuakini Highway are computed in Exhibits 1 and 2.

The data shows that Sites C and G along Kuakini Highway will be subjected to predicted exterior noise levels of 68 to 70 dBA at distances 300 to 500 feet from the highway. Assuming a maximum of 10 dBA attenuation between the exterior and interior of a classroom building, the classroom noise levels will be about 58 to 60 dBA. Sites A, D, E, and H along the proposed Alii Highway will be subjected to noise levels of 60 to 63 dBA. Assuming a 10 dBA attenuation, the expected classroom noise levels will be 50 to 53 dBA.

Based on the preceding, Sites C and G will require soundproofing measures to limit the classroom noise levels to a maximum of 55 dBA. The following cost estimates for soundproofing the classrooms at Sites C and G are provided:

(1) Construction Cost

Assumption:

Design Enrollment = 630 students
Number of Classrooms = 25 classrooms
Classroom Size = 960 sq. ft.
Tons A/C Per Room = 5 tons
Power Requirements = 1KW per ton A/C
Power Cost = $0.032 per KWhr (Schedule "P" Hawaii Electric Light Co.)

Cost = (25 classrooms)(5 tons)($1,500) = $187,500

(2) Maintenance Cost

Assumption:

Interest = Escalation = 6%
Maintenance Cost = 3% Construction Cost

Cost = 3%($187,500) = $5,625 annually

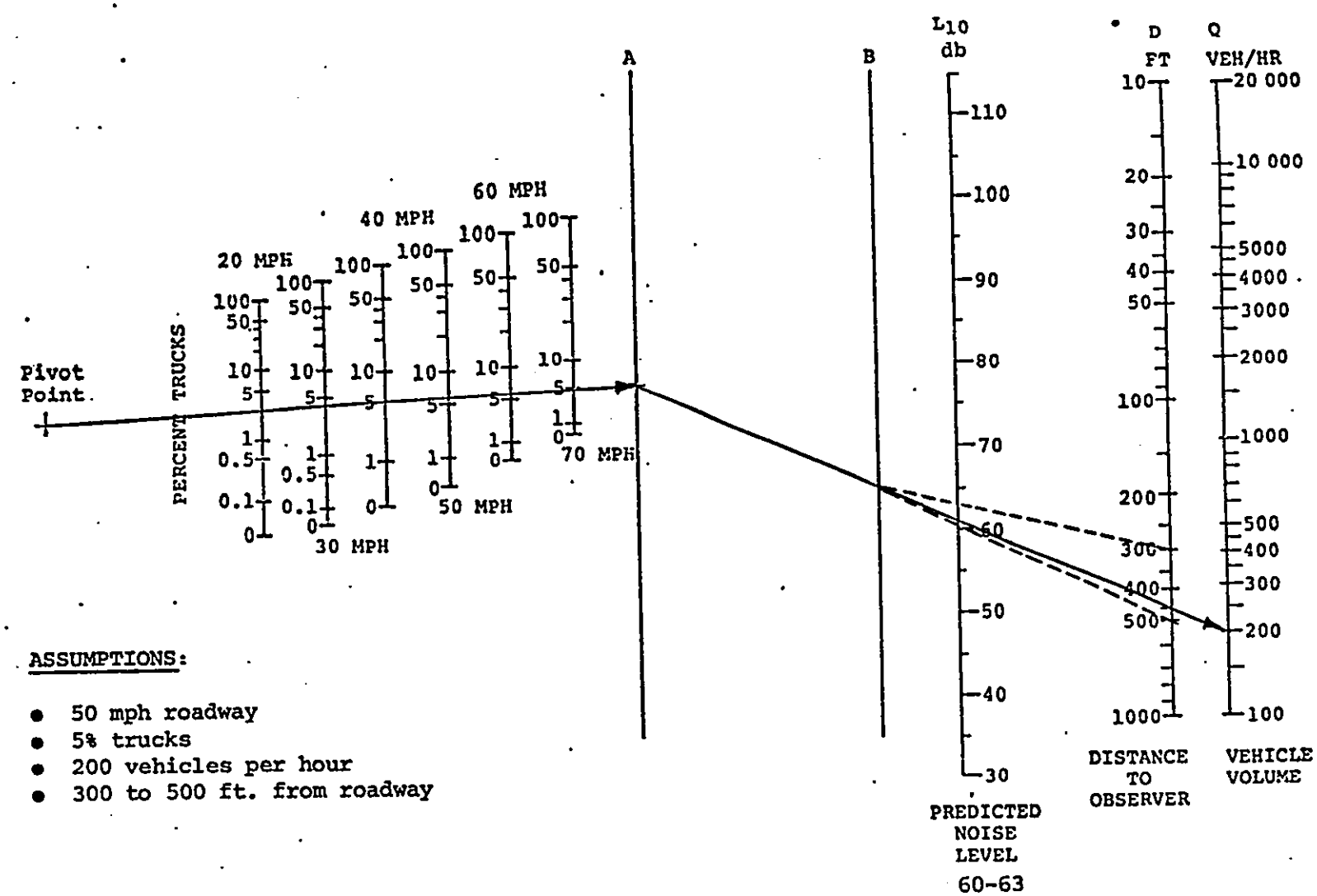
Present Worth Cost = ($5,625)(20 years) = $112,500

(3) Operating Cost

Assumption:

Operation = 8-hour day, 278 days per school year

NOMOGRAPH FOR APPROXIMATE PREDICTION OF HIGHWAY NOISE LEVELS (CONVENTIONAL TRUCKS) ALONG PROPOSED ALII HIGHWAY



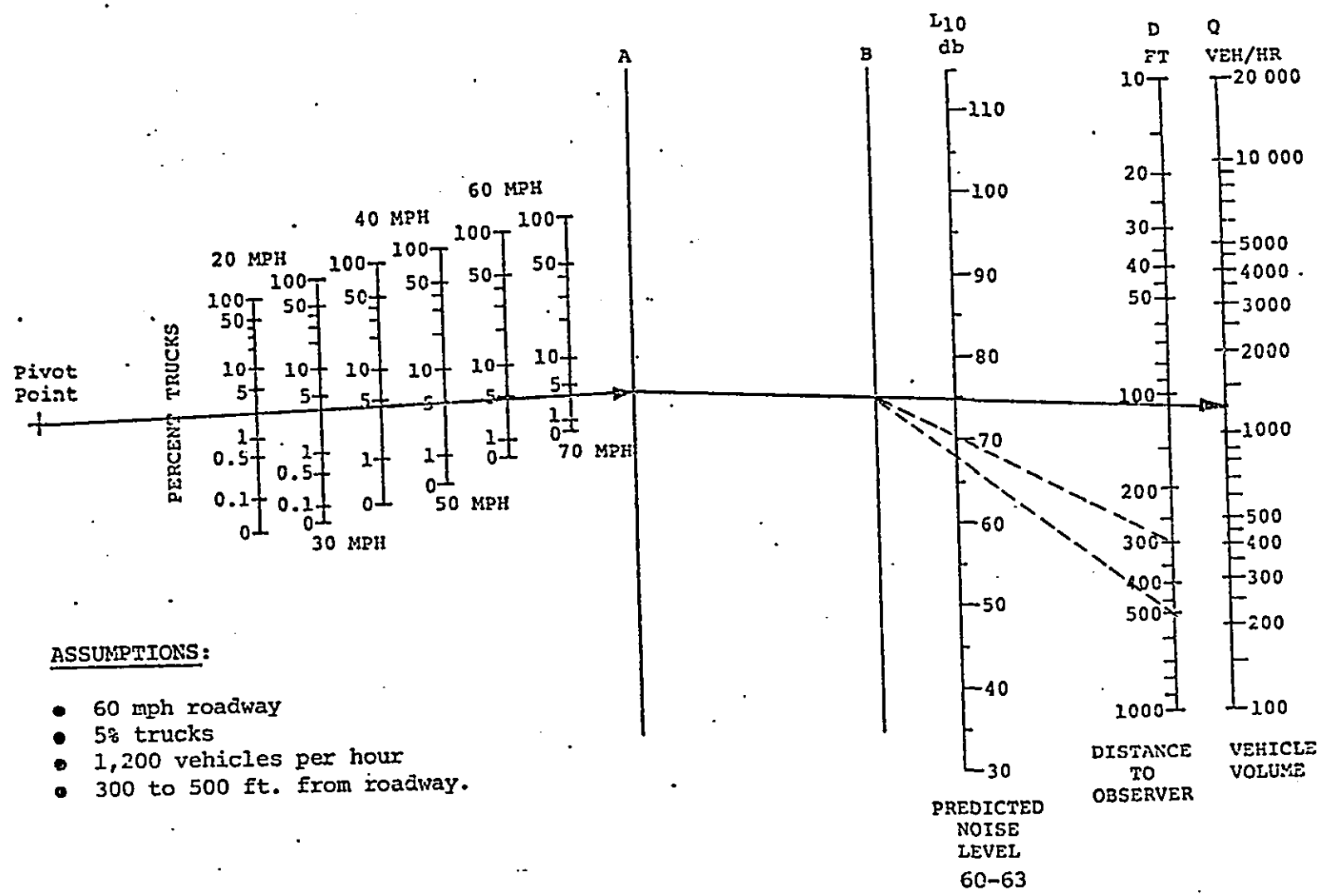
60-63

ASSUMPTIONS:

- 50 mph roadway
- 5% trucks
- 200 vehicles per hour
- 300 to 500 ft. from roadway

EXHIBIT 1

NOMOGRAPH FOR APPROXIMATE PREDICTION OF HIGHWAY NOISE LEVELS (CONVENTIONAL TRUCKS) ALONG KUAKINI HIGHWAY



60-63

ASSUMPTIONS:

- 60 mph roadway
- 5% trucks
- 1,200 vehicles per hour
- 300 to 500 ft. from roadway.

EXHIBIT 2

Interest I = 6% year
Fuel Escalation E = 10% year
Number of Years N = 20 years

Power Cost = (125 KW)(2,224 hr)($0.032) = $8,896 annually

Present Worth Cost = $R(SP\text{-}E_1)(PS\text{-}I_1) + \ldots R(SP\text{-}E_{20})(PS\text{-}I_{20})$

Where: R = Annual Power Cost = $8,896
(SP-En) = Escalation Factor
(PS-In) = Present Worth Factor

Year	R	10%(SPE)	6%(PS-I)	(SPE-E)(PS-I)	R(SP-E)(PS-I)
1	$8,896	1.100	.9434	1.038	$ 9,234
2		1.210	.8900	1.077	9,581
3		1.331	.8396	1.118	9,946
4		1.464	.7921	1.159	10,310
5		1.611	.7473	1.204	10,711
6		1.772	.7050	1.249	11,111
7		1.949	.6651	1.296	11,529
8		2.144	.6274	1.345	11,965
9		2.358	.5919	1.396	12,419
10		2.594	.5584	1.448	12,881
11		2.853	.5268	1.503	13,371
12		3.138	.4970	1.560	13,878
13		3.452	.4688	1.618	14,394
14		3.797	.4423	1.679	14,936
15		4.177	.4173	1.743	15,506
16		4.595	.3936	1.809	16,093
17		5.054	.3714	1.877	16,697
18		5.560	.3503	1.948	17,329
19		6.116	.3305	2.021	17,979
20		6.728	.3118	2.098	18,664
				Total	$268,534

Total Air Conditioning Cost = $568,500

OFF-SITE DEVELOPMENT COST

The off-site improvements required for each alternative site are shown in Exhibits 3 through 12. The specific improvements for each site is computed as follows:

UTILITIES

The off-site utility costs vary for each alternative site and are computed for the following items:

(1) Water - Sites C, F, G, and H have existing adequate water mains which can meet the ultimate water require-

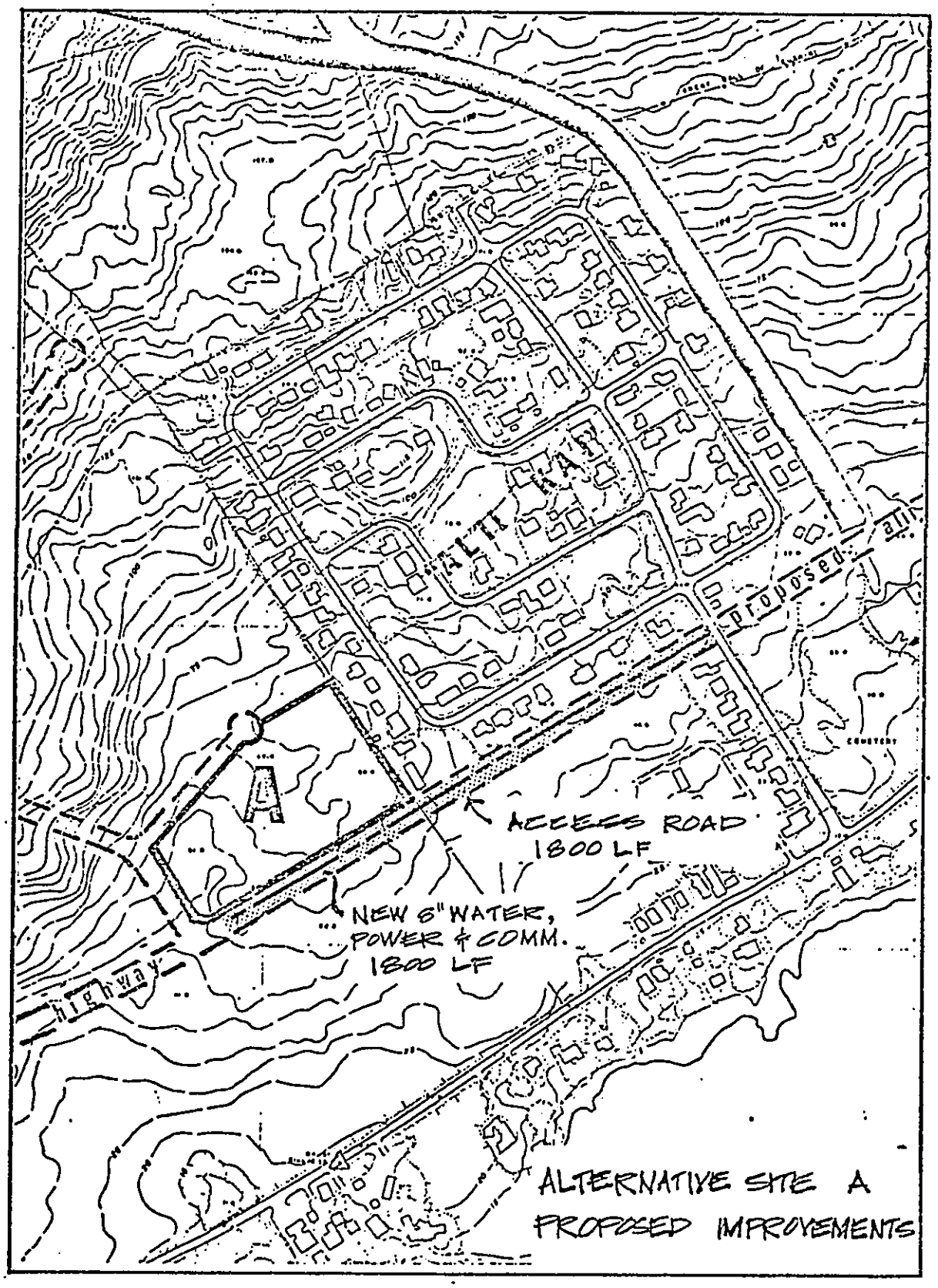

ALTI KAP
proposed alt
A
ACCESS ROAD
1800 LF
NEW 6" WATER,
POWER & COMM.
1800 LF
highway
ALTERNATIVE SITE A
PROPOSED IMPROVEMENTS

EXHIBIT 3

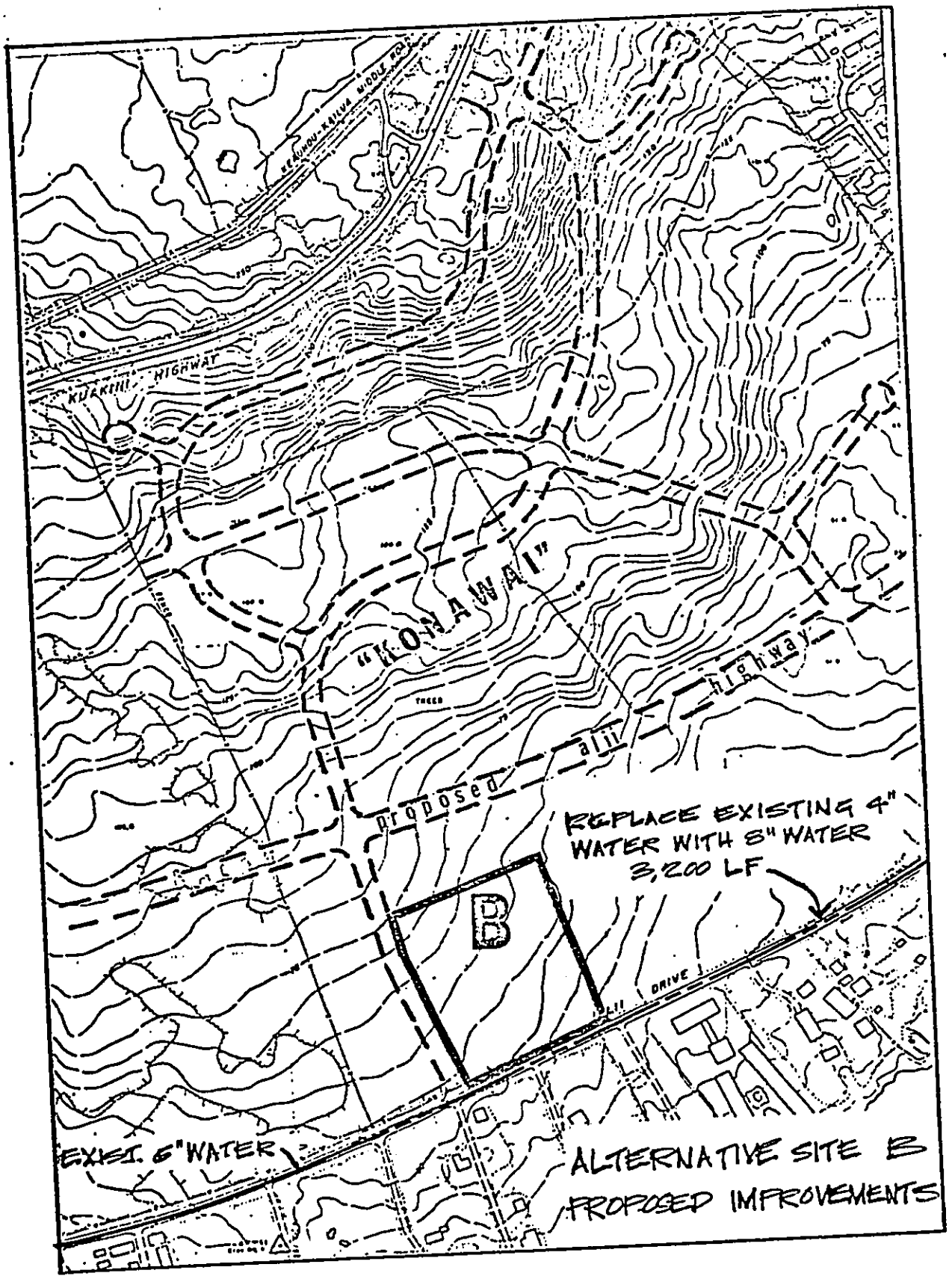

KUAKINI HIGHWAY
"KONAWAI"
proposed alii highway
REPLACE EXISTING 4" WATER WITH 8" WATER 3,200 LF
B
DRIVE
EXIST. 6" WATER
ALTERNATIVE SITE B
PROPOSED IMPROVEMENTS

EXHIBIT 4

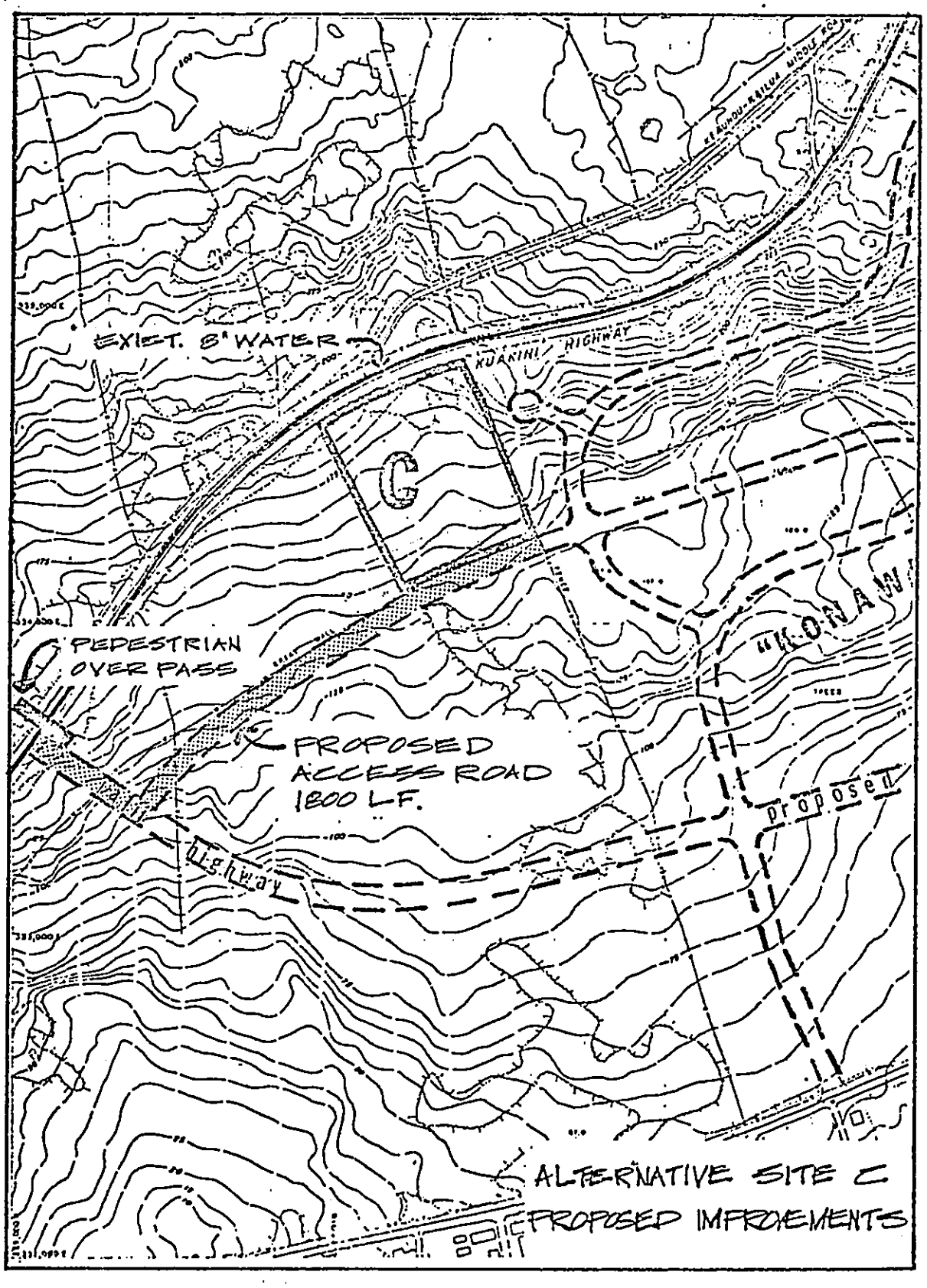

EXIST. 8" WATER
KUAKINI HIGHWAY
C
PEDESTRIAN OVER PASS
PROPOSED ACCESS ROAD 1800 L.F.
Highway
"KONA"
proposed
ALTERNATIVE SITE C
PROPOSED IMPROVEMENTS

EXHIBIT 5

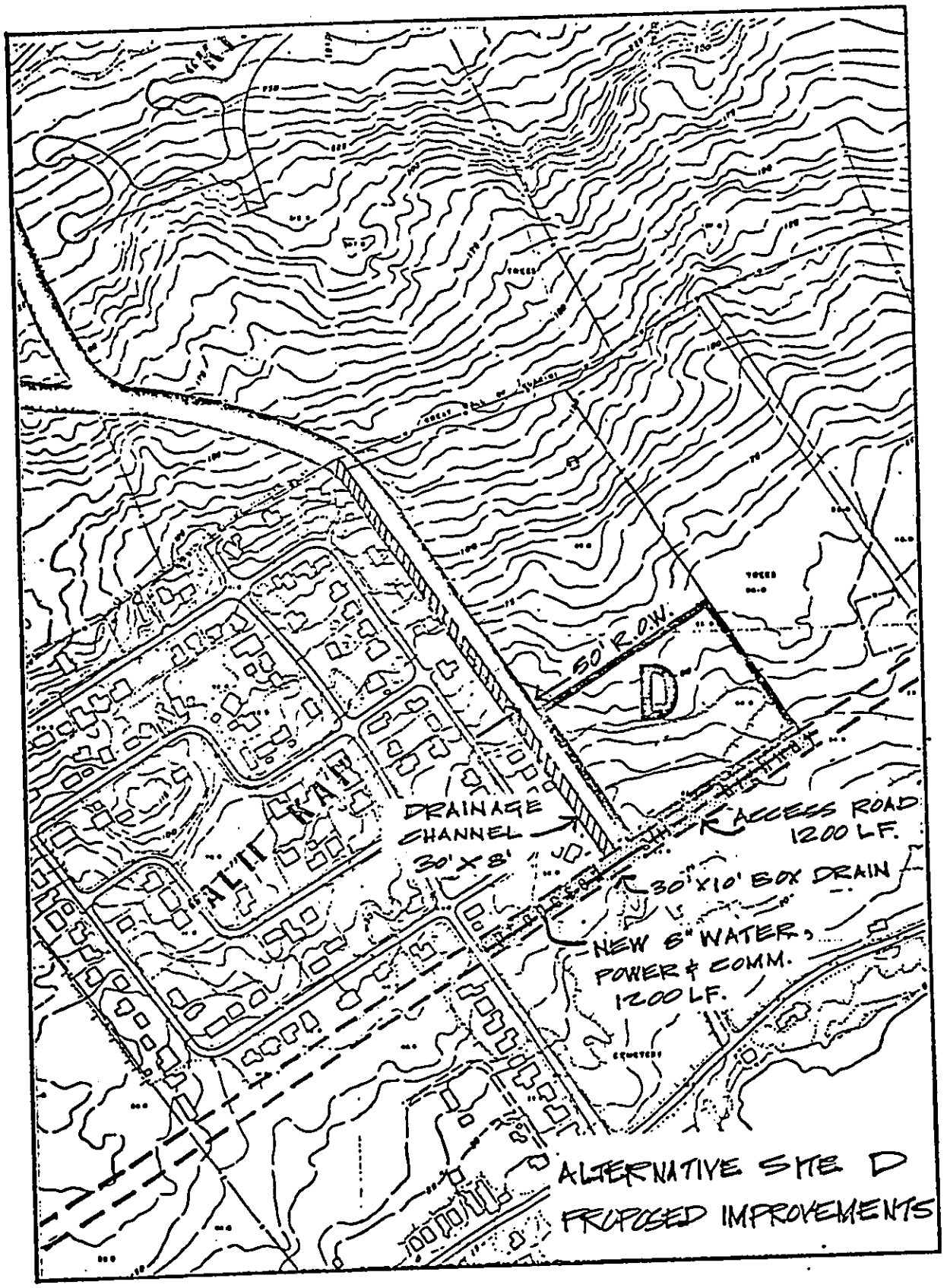

60' R.O.W.
D
DRAINAGE CHANNEL 30' X 8'
ACCESS ROAD 1200 LF.
30" X 10' BOX DRAIN
NEW 6" WATER, POWER & COMM. 1200 LF.
ALTERNATIVE SITE D
PROPOSED IMPROVEMENTS

EXHIBIT 6

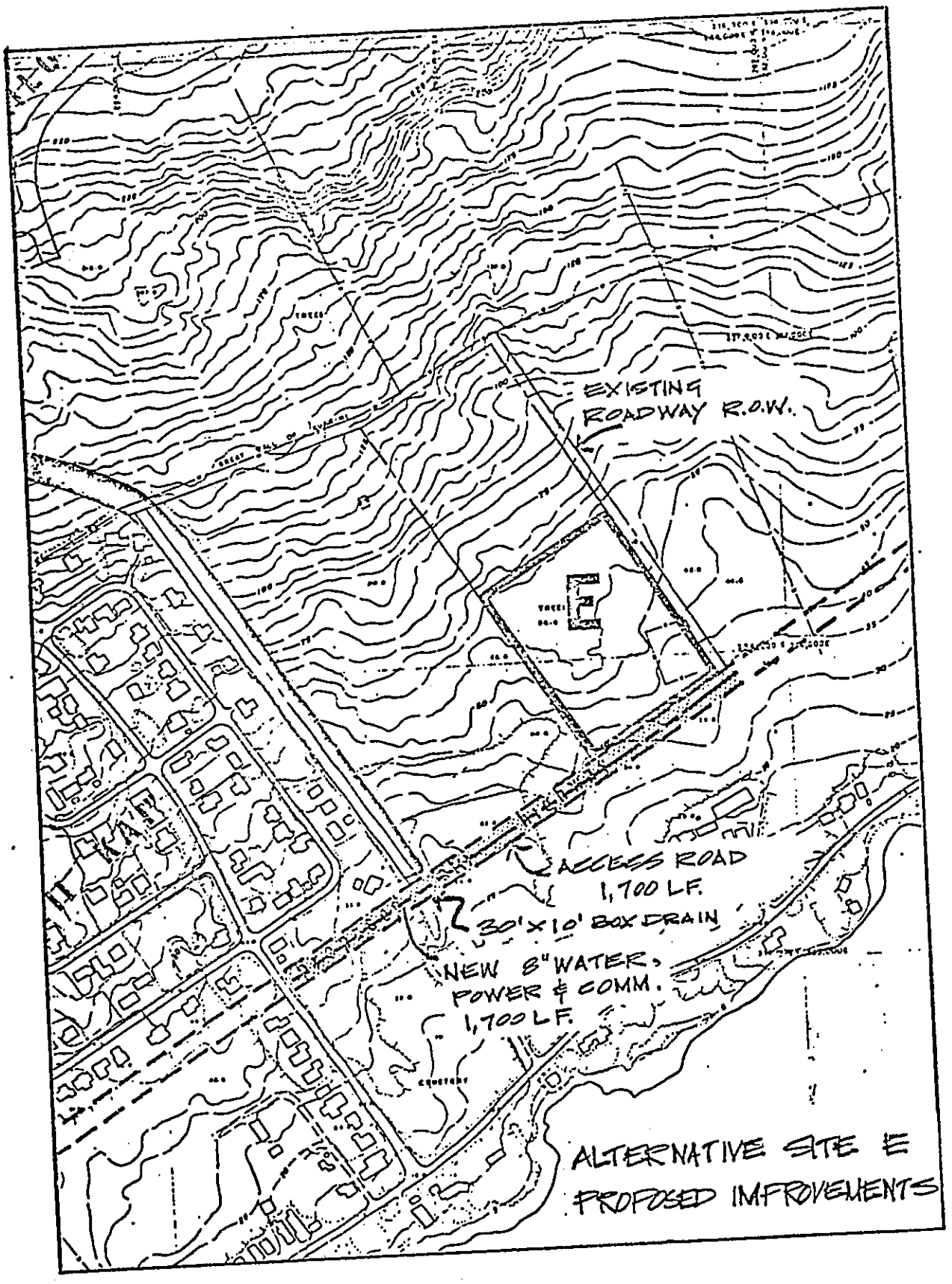

EXISTING
ROADWAY R.O.W.
ACCESS ROAD
1,700 LF.
30'x10' BOX DRAIN
NEW 8" WATER,
POWER & COMM.
1,700 LF.
ALTERNATIVE SITE E
PROPOSED IMPROVEMENTS

EXHIBIT 7

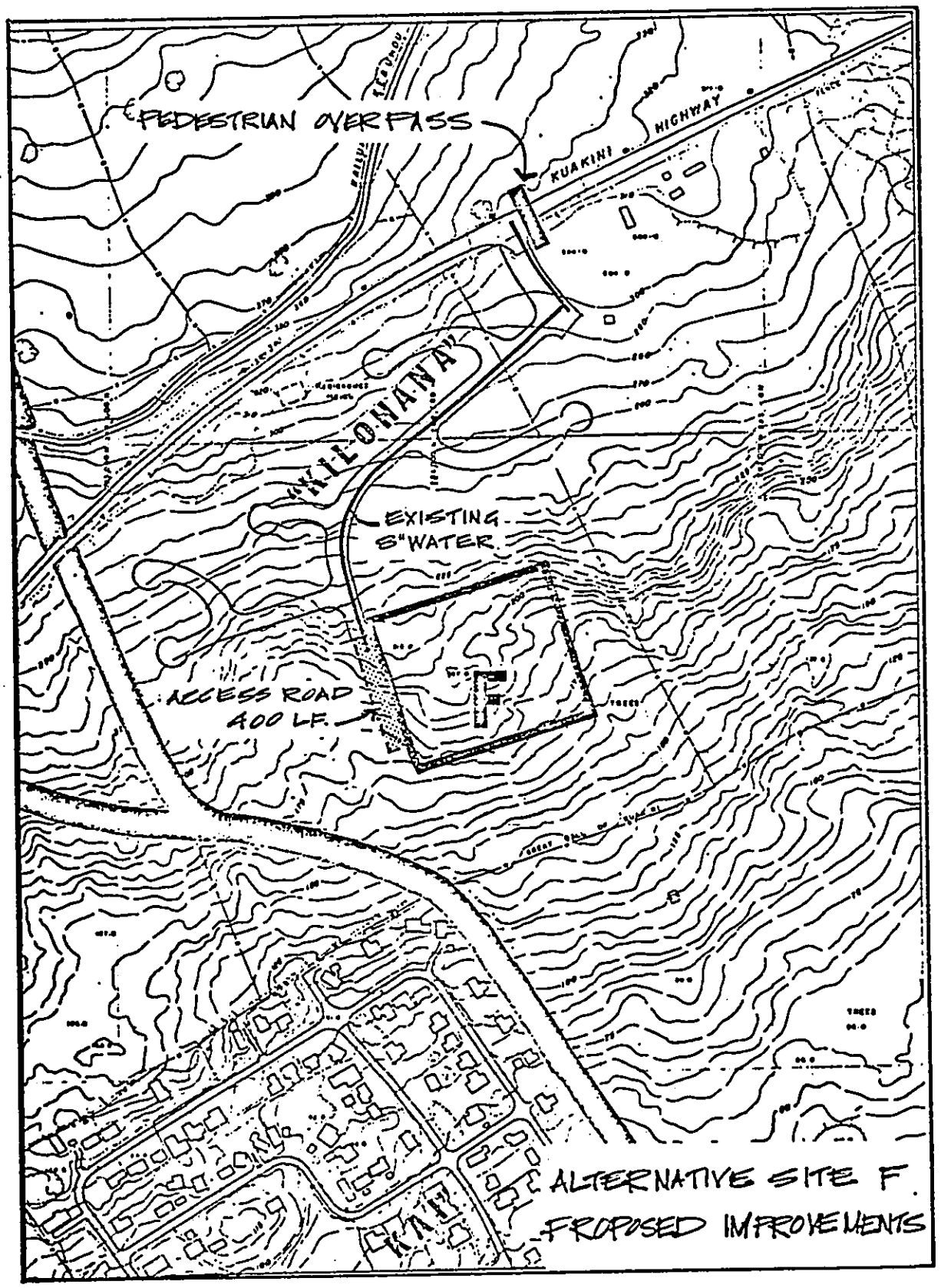

PEDESTRIAN OVERPASS
KUAKINI HIGHWAY
KALONAWA
EXISTING 6" WATER
ACCESS ROAD 400 LF.
ALTERNATIVE SITE F
PROPOSED IMPROVEMENTS

EXHIBIT 8

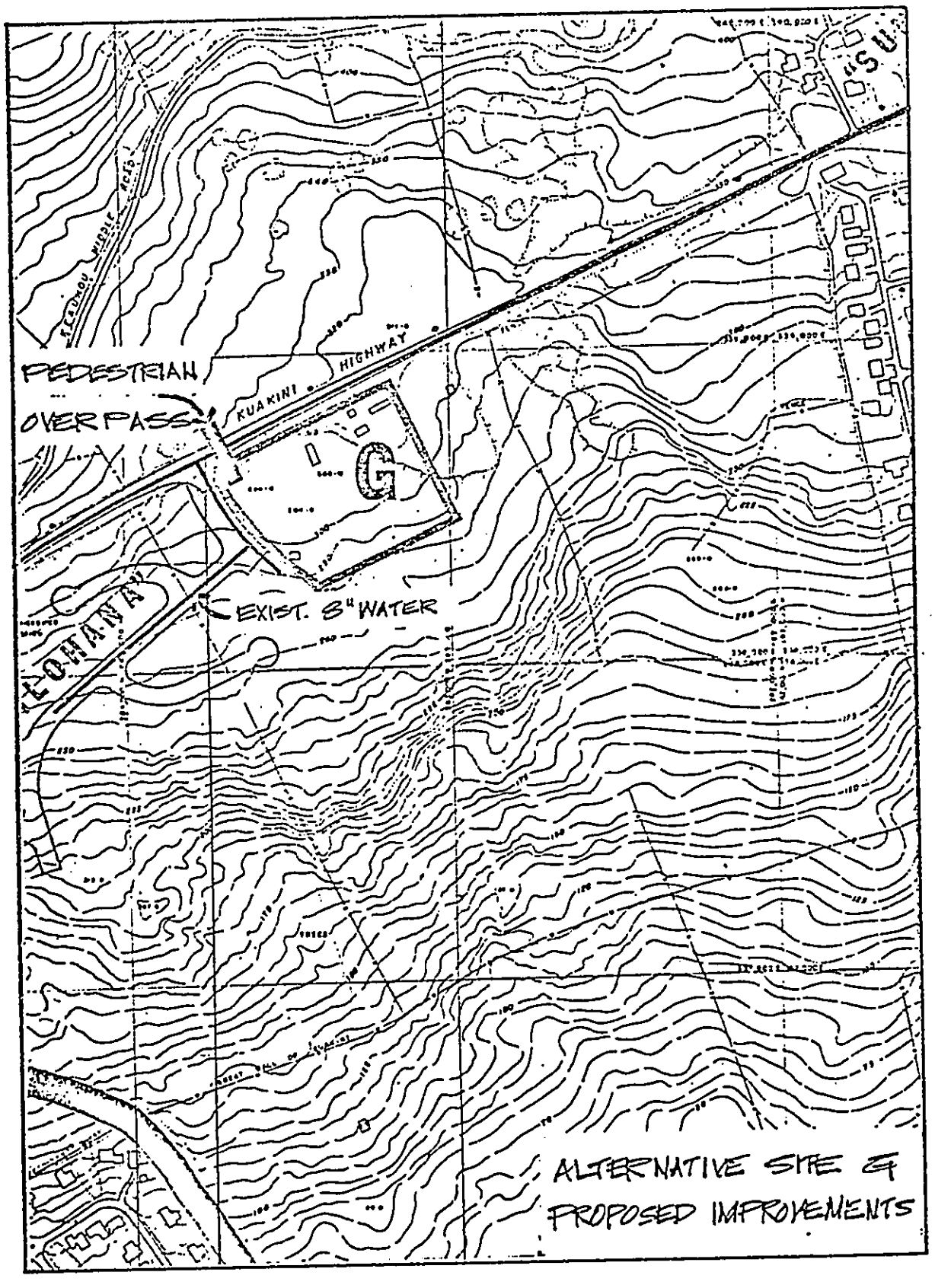

PEDESTRIAN
OVERPASS
KUAKINI HIGHWAY
EXIST. 8" WATER
ALTERNATIVE SITE &
PROPOSED IMPROVEMENTS

EXHIBIT 9

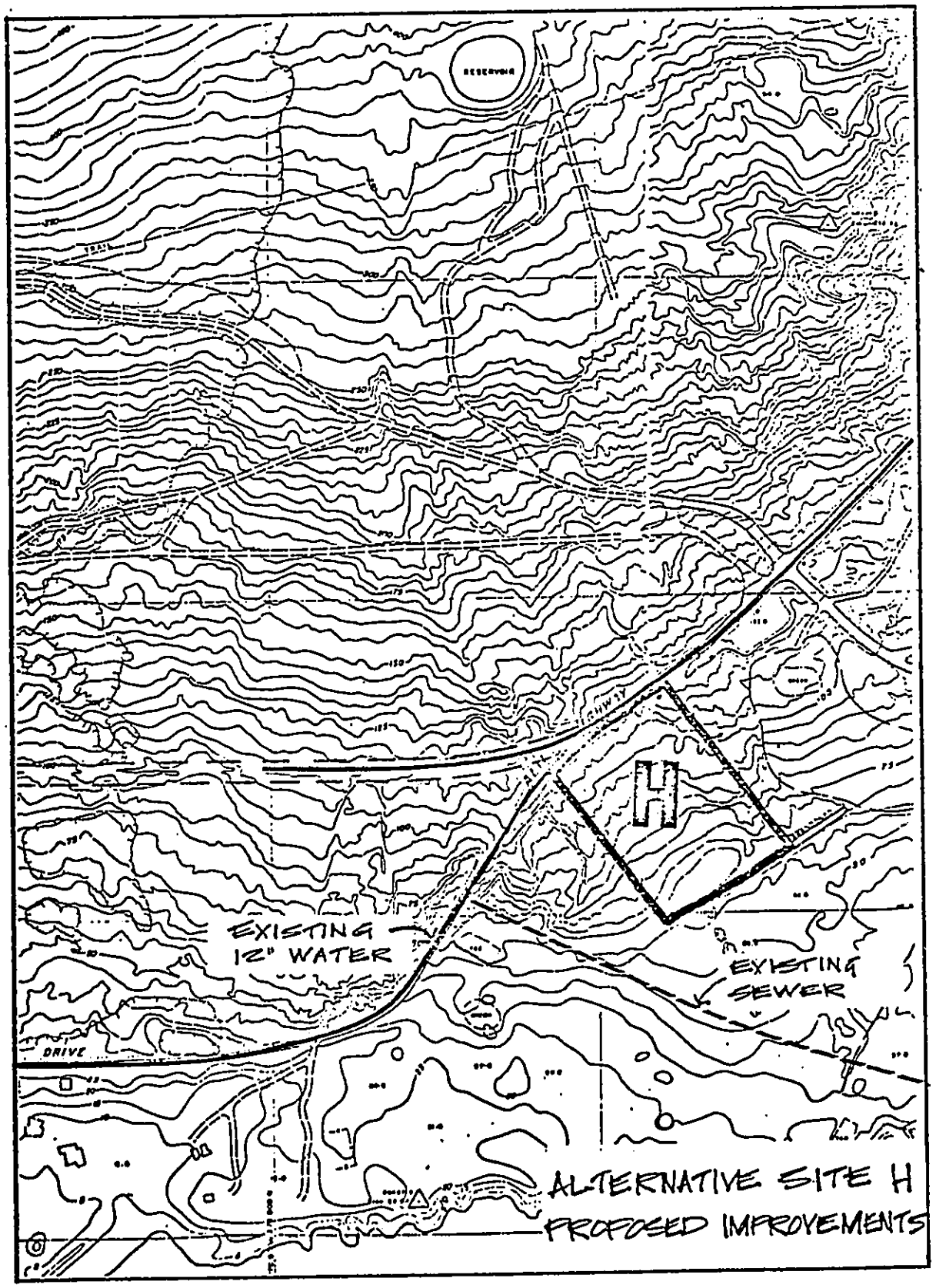

RESERVOIR
EXISTING
12" WATER
EXISTING
SEWER
DRIVE
ALTERNATIVE SITE H
PROPOSED IMPROVEMENTS

EXHIBIT 10

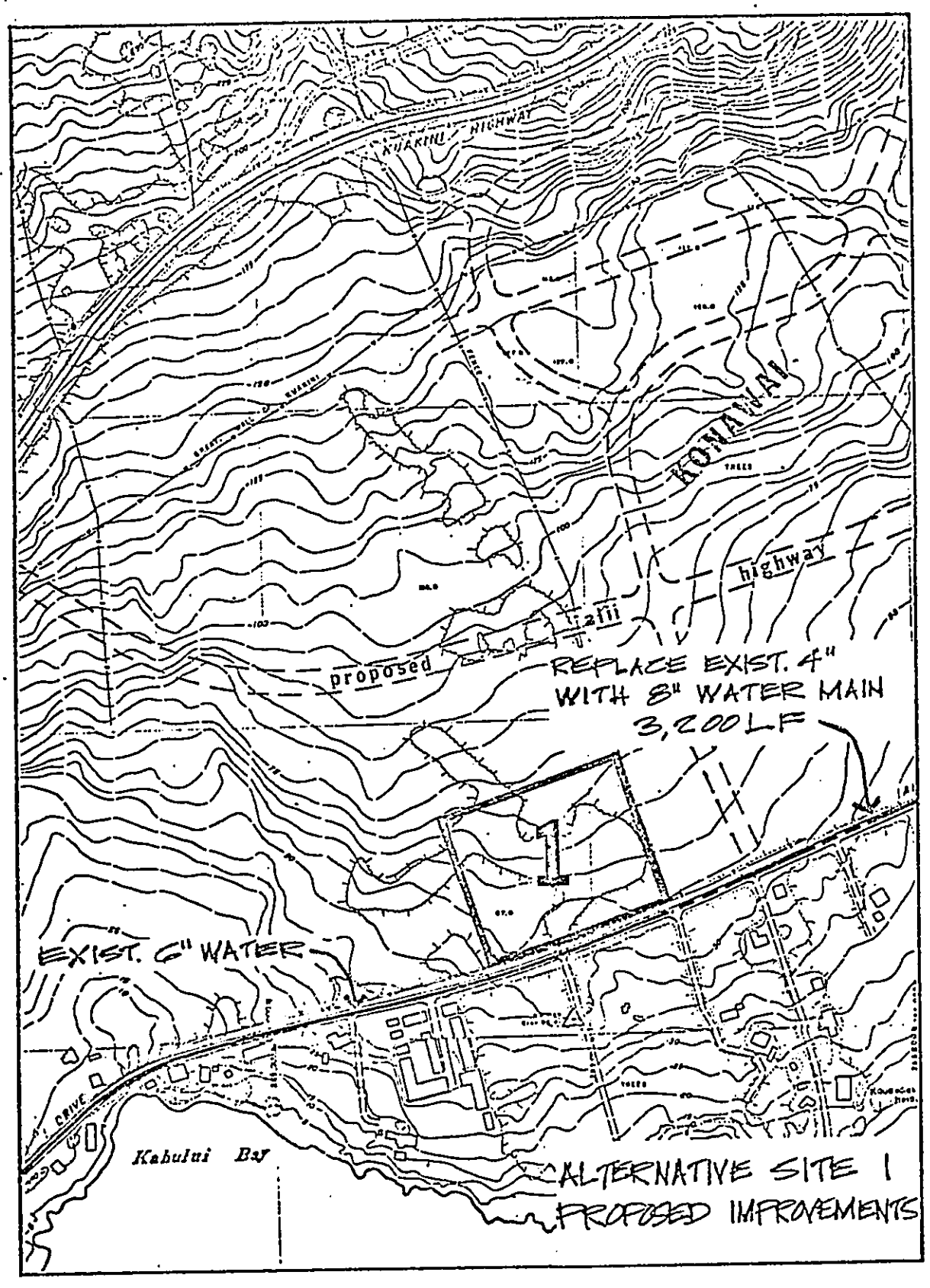

KUAKINI HIGHWAY
KOHALA
highway
proposed
REPLACE EXIST. 4"
WITH 8" WATER MAIN
3,200 LF
EXIST. 6" WATER
Kahului Bay
ALTERNATIVE SITE 1
PROPOSED IMPROVEMENTS

EXHIBIT 11

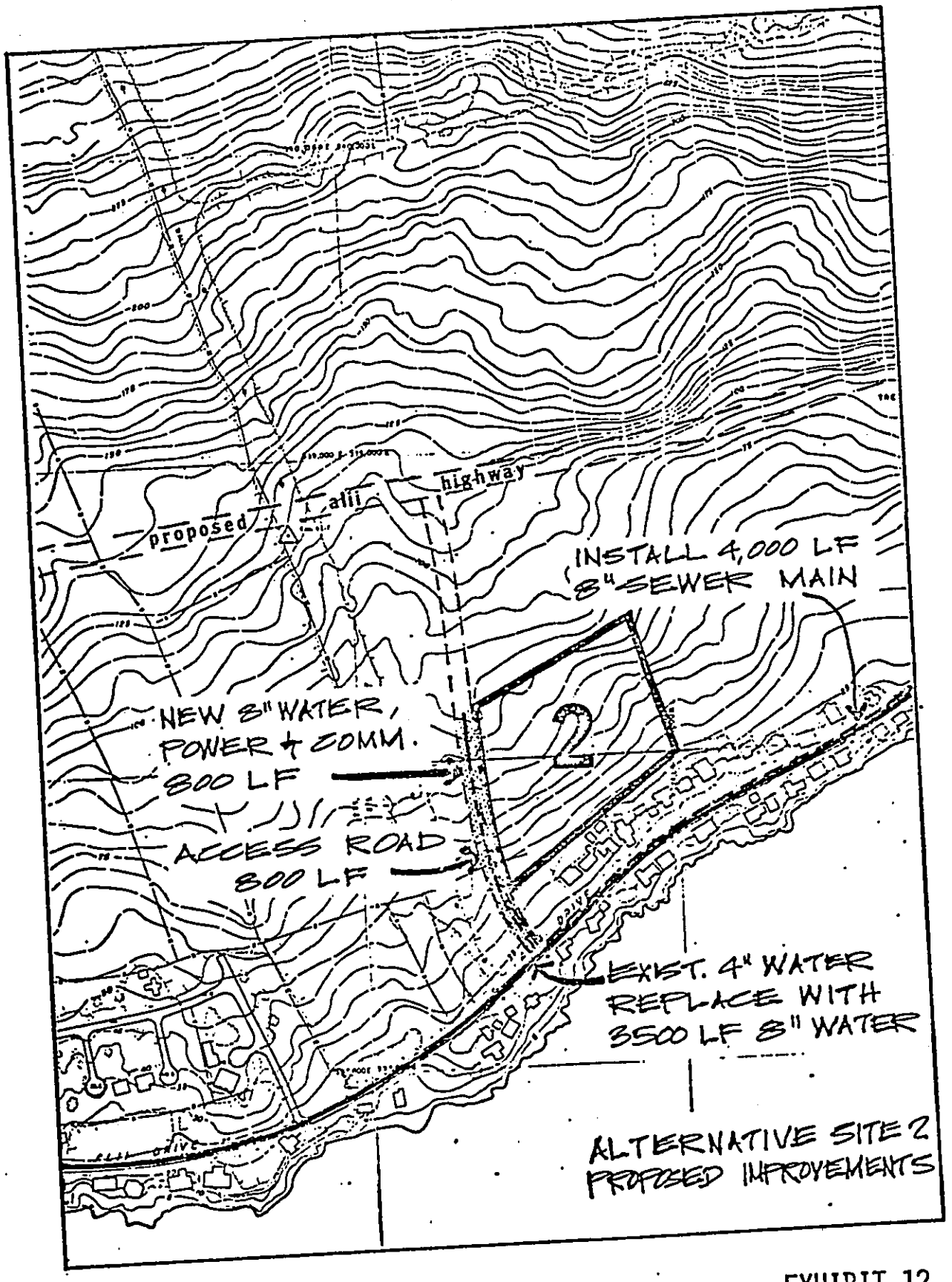

proposed
alii
highway
INSTALL 4,000 LF
8" SEWER MAIN
NEW 8" WATER,
POWER + COMM.
800 LF
ACCESS ROAD
800 LF
EXIST. 4" WATER
REPLACE WITH
3500 LF 8" WATER
ALTERNATIVE SITE 2
PROPOSED IMPROVEMENTS

EXHIBIT 12

ments for a school development. No off-site water system costs are therefore allocated to these sites. The remaining Alternative Sites, A, B, D, E, 1, and 2 will require the following water system improvements:

Site A - Although this site is part of the proposed "Konawai" Development there is no assurance that the waterlines will be available by the school opening date. For this study, it is assumed that a new waterline will be installed along the proposed Alii Highway corridor from Alii Kai Subdivision to the proposed site. The estimated cost of the waterline is:

1,800 l.f. 8-inch main @ $30/l.f. = $54,000

Site B - This site is serviced by an existing 4-inch line along Alii Drive. Development of a school at the site will require replacement of the 4" line with a new 8" line. The estimated cost for this improvement is:

3,200 l.f. 8-inch main @ $30/l.f. = $96,000

Site D - There is no water service to this site and there are no proposed development plans. Accordingly, it will be necessary to extend a water main from Alii Kai Subdivision to the site along the proposed Alii Highway corridor. The estimated cost of the waterline is:

1,200 l.f. 8-inch main @ $30/l.f. = $36,000

Site E - This site is located adjacent to Site D and also lacks water service. The estimated cost of extending a waterline from Alii Kai Subdivision along Alii Highway to the site is:

1,700 l.f. 8-inch main @ $30/l.f. = $51,000

Site 1 - This site is serviced by an existing 6-inch main along Alii Drive. Development of a school at this location will require replacement of the adjoining 4-inch line with an 8-inch main to meet fire flow requirements. The estimated cost of this improvement is:

3,200 l.f. 8-inch main @ $30/l.f. = $96,000

Site 2 - This site has no existing water service available. The closest water source is located 800 ft. makai of the site along Alii Drive. Since the existing 4-inch line is inadequate for fire protection, it will be necessary to install approximately 3,500 l.f. of 8-inch main along Alii Drive and an additional 800 l.f. of 8-inch main to the site. The estimated cost of the improvement is:

3,500 l.f. + 800 l.f. 8-inch main @ $30/l.f.
= $129,000

(2) Sewer - Alternative Sites A, B, C, D, E, F, G, and 1 will be provided with on-site sewage disposal systems and no off-site sewer system improvements will be required for these sites. Alternative Site H is serviced by a sewer system and no off-site improvements are anticipated for this site. Alternative Site 2 can be served by the existing Keauhou sewerage system. However, this site will require an extension of the existing sewer line along Alii Drive to the site. The estimated cost of installing approximately 4,000 l.f. of 8-inch sewer main is:

4,000 l.f. 8-inch V.C.P. @ $50/l.f. = $200,000

(3) Power and Communications - All of the alternative sites except Sites A, D, E, and 2 have existing power and communications available at the site. Sites A, D, E, and 2 will require extension of these services to specifically serve a school development. The scope and cost of providing the necessary improvements are as follows:

Site A - This site will require extension of power and communication service along Alii Highway from Alii Kai Subdivision to the site. The estimated cost of this off-site work is computed as follows:

1,800 l.f. service line @ $10/l.f. = $18,000

Site D - This site will require extension of power and communication service along Alii Highway from Alii Kai Subdivision to the site. The estimated cost of this off-site work is computed as follows:

1,200 l.f. service line @ $10/l.f. = $12,000

Site E - This site is adjacent to Site D and will require additional off-site power and communication service extensions as follows:

1,700 l.f. service line @ $10/l.f. = $17,000

Site 2 - This site will require extension of power and communication service mauka from Alii Drive along the access road to the site. The estimated cost of this off-site work is:

800 l.f. service line @ $10/l.f. = $8,000

DRAINAGE

No off-site drainage improvements are anticipated for all of the alternative sites except Site D. Site D abuts the County's proposed Holualoa Drainage Channel which is adjacent to Alii Kai Subdivision. The development of Site D will require improvement of the existing 10' x 4' trapezoidal channel to a 30' x 8' channel within the existing 30' R.O.W. along the existing subdivision boundary. The proposed improvement will channelize the mauka drainage and prevent flooding of the proposed Site D. The estimated scope of work and cost for the off-site drainage improvements are computed as follows:

Land Acquisition - None (within existing 30-ft. R.O.W.)

1,500 l.f. 30' x 8' unlined channel @ $150/l.f. = $225,000
(excavation 7.4 cy/l.f. @ $20 = $148/l.f. Say: $150/l.f.)

ACCESS ROADS

Alternative Sites B, G, H, and 1 are accessible from existing roadways and will not require off-site road improvements. Alternative Sites A, C, D, E, F, and 2 will require improvements as follows:

Site A - This site abuts the proposed Alii Highway alignment and the proposed Konawai Development roadways. Since the new highway is not scheduled for completion by 1980, it will be necessary to construct an access road to the site before it can be developed for a school. It is assumed that a 50-foot R.O.W. roadway can be constructed from Royal Poinciana Drive and follow the existing 50-foot right-of-way for 1,050 l.f. to the south boundary of the site. The roadway would then continue an additional 750 l.f. along the proposed Alii Highway alignment to the north boundary of the site for a total roadway length of 1,800 l.f. The estimated cost for the access road is as follows:

Land Acquisition 50 ft. x 750 l.f. = 37,500 s.f. @ $1	=	$ 37,500
Land Acquisition Services - L.S.	=	11,500
Roadway Cost - 1,800 l.f. @ $130/l.f.	=	234,000
Total Roadway Cost		$283,000

Site C - This site is adjacent to Kuakini Highway. However access from the highway would be hazardous based on the existing roadway alignment. Access to the site is therefore proposed from the future Alii Highway and the "Konawai" Subdivision roadways. If this site is developed for a

school, it will be necessary to construct approximately 400 l.f. of Alii Highway and 1,600 l.f. of access road from Alii Highway to the "Konawai" Subdivision. The estimated cost is as follows:

Land Acquisition 50 ft. x 2,000 l.f. = 100,000 s.f. @ $1	=	$100,000
Land Acquisition Services - L.S.	=	10,000
Roadway Cost - 2,000 l.f. @ $130/l.f.	=	260,000
Total Roadway Cost		$370,000

Site D - This site abuts the proposed Alii Highway alignment south of Alii Kai Subdivision. Development of a school at this site will require the construction of an access road for approximately 1,200 l.f. along the existing 50-ft. roadway R.O.W. The roadway construction will also necessitate the installation of a box culvert to accommodate the mauka Holualoa Drainage Channel. The cost of constructing a 50-foot access road from Royal Poinciana Drive for 1,200 l.f. to the site is computed as follows:

Land Acquisition - None (existing R.O.W.)		
Roadway Cost - 1,200 l.f. @ $130/l.f.	=	$156,000
Box Culvert - 30' x 10' x 100 l.f. L.S.	=	78,000
Total Roadway Cost		$234,000

Site E - This site is adjacent to Site D and will require construction of a similar access road which is 500 l.f. longer. The estimated cost of a 50-foot roadway 1,700 l.f. long is computed as follows:

Land Acquisition - None (existing R.O.W.)		
Roadway Cost - 1,700 l.f. @ $130/l.f.	=	$221,000
Box Culvert - 30' x 10' x 100 l.f. L.S.	=	78,000
Total Roadway Cost		$299,000

Site F - This site is located at the end of the existing 60-foot right-of-way roadway in Kilohana Subdivision. An extension of the subdivision road is required to provide adequate access to this site. The cost of constructing a 400 l.f. extension of the roadway is computed as follows:

Land Acquisition 60' x 400' = 24,000 s.f. @ $1/s.f.	=	$24,000
Land Acquisition Services - L.S.	=	8,000
Roadway Cost - 400 l.f. @ $155/l.f.	=	62,000
Total Roadway Cost		$94,000

Site 2 - This site is located mauka of Alii Drive within the future development area proposed by Kamehameha Development Corporation. Since there is no existing roadway to the site, it will be necessary to construct approximately 800 l.f. of access road from Alii Drive. The estimated cost of this roadway is as follows:

Land Acquisition 60 ft. x 800 l.f. = 48,000 s.f. @ $1/s.f.	=	$ 48,000
Land Acquisition Services - L.S.	=	10,000
Roadway Cost - 800 l.f. @ $155/l.f.	=	124,000
Total Roadway Cost		$182,000

PEDESTRIAN OVERPASS

Because of the projected vehicular speed and volume along Kuakini Highway, Alternative Sites C, F, and G which are located along Kuakini Highway will require the construction of a pedestrian overpass over Kuakini Highway. The estimated cost of an overpass is:

Pedestrian Overpass - L.S. = $250,000

BUS SUBSIDY

An allowance for bus transportation is provided to students residing more than one mile (road distance) away from the school. For purposes of this study the costs of the monthly subsidies over a 20-year period are computed and compared for each alternative site.

The bus subsidy costs for the alternative sites were computed based on the following enrollment projections provided by the DOE:

1980-1985	330 students
1985-1990	420 students
1990-2000	630 students

In order to compute the bus subsidy for each alternative site, it was assumed there would be an equal distribution of the students within the service area based on the percentage of residential zoned lands with the school service area. The following assumptions were also used:

1980-1985

1. No road connection from Alii Kai to Kilohana.
2. Total residential acreage = 788.
3. Total enrollment = 330 students.

1985-1990

1. Completion of new Alii Highway.
2. Road connection between Alii Kai and Kilohana.
3. Total residential acreage = 788.
4. Total enrollment = 420 students.

1990-2000

1. Total enrollment = 630 students.
2. No change in residential acreage from 1985-1990.

The number of students qualifying for bus subsidy for each site are computed as follows:

1980-1985 (330 Enrollment)

Site	Ac. Within 1 Mile	% Walking	% Bussed	No. Students Bussed
A	150	19	81	267
B	150	19	81	267
C	36	5	95	314
D	159	20	80	264
E	149	19	81	267
F	331	42	58	191
G	331	42	58	191
H	184	23	77	254
1	175	22	78	257
2	126	16	84	277

1985-1990 (420 Enrollment)

Site	Ac. Within 1 Mile	% Walking	% Bussed	No. Students Bussed
A	350	44	56	235
B	252	32	68	286
C	242	31	69	290
D	433	55	45	189
E	455	58	42	176
F	471	60	40	168
G	452	57	43	181
H	184	23	77	323
1	209	27	73	307
2	126	16	84	353

1990-2000 (630 Enrollment)

Site	Ac. Within 1 Mile	% Walking	% Bussed	No. Students Bussed
A	350	44	56	353
B	252	32	68	428
C	242	31	69	435
D	433	55	45	284
E	455	58	42	265
F	471	60	40	252
G	452	57	43	271
H	184	23	77	485
1	209	27	73	460
2	126	16	84	529

The bussing costs for each alternative site are computed as follows:

$$PW_T = PW_1 + \ldots PW_{20}$$

$$= RN\ (SP\text{-}6_1)\ (PS\text{-}6_1) + \ldots RN\ (SP\text{-}6_{20})\ (PS\text{-}6_{20})$$

Where:

PW_T = Present worth cost for 20 years.

R = $107/year regular annual bus subsidy per student based on data provided by Central Services Division, DAGS.

(SP-En) = Escalation factor

(PS-In) = Present worth factor

N = Number of students

n = Number of years

I = 6% interest

E = 6% escalation

Since I = E = 6%, the interest and escalation cancel each other and the above equation reduces to:

$$PW_T = RN_1n_1 + RN_2n_2 + RN_3n_3$$

Where:

R = $107

N_1 = Number of students (1980-1985)

N_2 = Number of students (1985-1990)

N_3 = Number of students (1990-2000)

$n_1 = n_2 = 5$ years

$n_3 = 10$ years

$$PW_T = \$535N_1 + \$535N_2 + \$1,070N_3$$

1980-1985

Site	Students	Cost/Student	Cost
A	267	$535	$142,845
B	267	$535	$142,845
C	314	$535	$167,990
D	264	$535	$141,240
E	267	$535	$142,845
F	191	$535	$102,185
G	191	$535	$102,185
H	254	$535	$135,890
1	257	$535	$137,495
2	277	$535	$148,195

1985-1990

Site	Students	Cost/Student	Cost
A	235	$535	$125,725
B	286	$535	$153,010
C	290	$535	$155,150
D	189	$535	$101,115
E	176	$535	$94,160
F	168	$535	$89,880
G	181	$535	$96,835
H	323	$535	$172,805
1	307	$535	$164,245
2	353	$535	$188,855

1990-2000

Site	Students	Cost/Student	Cost
A	353	$1,070	$377,710
B	428	$1,070	$457,960
C	435	$1,070	$465,450
D	284	$1,070	$303,880
E	265	$1,070	$283,550
F	252	$1,070	$269,640
G	271	$1,070	$289,970
H	485	$1,070	$518,950
1	460	$1,070	$492,200
2	529	$1,070	$566,030

Bus Subsidy Cost Summary

Site	20-Year Cost
A	$646,280
B	$753,815
C	$788,590
D	$546,235
E	$520,555
F	$461,705
G	$488,990
H	$827,645
1	$793,940
2	$903,080

APPENDIX C

INTERGOVERNMENTAL CORRESPONDENCE

RECEIVED
DEC 20 9 05 AM '74
PUBLIC WORKS DIV.
DAGS

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

December 13, 1974

MEMO TO: Mr. Mike N. Tokunaga, Acting Comptroller
Department of Accounting and General Services

F R O M: Teichiro Hirata, Superintendent
Department of Education

SUBJECT: Site Selection Study for Kailua-Keauhou Elementary School

In accordance with DOE-DAGS procedures dated March, 1973, we request a site selection study be initiated for Kailua-Keauhou Elementary School. The following planning information is provided:

Service Area.....	See attached map		
Type of School	Elementary with Grades K-6		
Size of School Site	Approximately 10 acres		
Design Enrollment	550		
Scheduled Opening Date ...	1980		
Enrollment Projections:...	1980	1985	1990
	225*	425**	500

*Phase 1 - Alii Drive between Kailua and Keauhou.
**Phase 2 - Add Kuakini Highway between Kailua and Kamehameha Road

Funds to be Used in Conducting Study: SLH 1974, Act 218, Item G-35

Alternative Sites

Kailua-Keauhou Elementary is scheduled to open to preclude excessive enrollment levels at Kealakehe Elementary. Continuous enrollment growth has occurred at Kealakehe School for the past several years due to in-migration of students from other Islands of the Hawaiian Chain and the mainland U. S. Enrollment growth is projected to continue at or near current rates, stimulated in part by State and private development housing proposals for the North Kona area.

DEC 18 1974

The proposed Kailua-Keauhou Elementary service area is now served by Kealakehe Elementary and Konawaena Elementary. Approximately 200, Grade K-6 students currently reside within the proposed service area and further growth is anticipated. The potential for new housing construction in the next 15-20 years is estimated to be in the range of 800-1200 units if additional subdivisions are constructed as proposed. Our estimate excludes resort-oriented condominiums that would normally have a negligible effect on enrollment.:

We request that your study include but not be limited to an evaluation of the following:

Alternative Site "A" - A site within the proposed Konawai Heights Subdivision (597 units). The developer has agreed to temporarily set aside 10 acres for school purposes pending completion of the site study. See Enclosure 2.

Alternative Site "B" - A site centrally located to the largest existing subdivisions:

Alii Kai Subdivision	(201	Lots,	approximately	90%	developed)
Sunset "	(190	"	"	30%	")
Seaview "	(140	"	"	90%	")
Kilohana "	(230	"	"	5%	")

The site should permit a maximum number of students to walk to school.

Site Access

If the selected site is located between Alii Drive and Kuakini Highway, a major consideration will be needed for direct connecting access to the school from both arterials. Direct access is highly desirable to avoid unnecessary student travel and to help preclude traffic congestion.

Richard Kurita

DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

RECEIVED
FEB 4 09 PM '75
PUBLIC WORKS DIV.
DAGS

February 3, 1975

Ref. No. 2915

MEMORANDUM

TO: ✓ The Honorable Hideo Murakami, State Comptroller
Department of Accounting and General Services

The Honorable Teichiro Hirata, Superintendent
Department of Education

FROM: Hideto Kono, Director

SUBJECT: Kailua-Keauhou Elementary School, Site Selection, North Kona, Hawaii, DAGS Job No. 01-16-6734, as Authorized by Act 218, SLH 1974, Item G-35

In response to DAGS Letter No. S-073.5, dated January 27, 1975, requesting the release of $10,000 for the subject project, we believe further justification should be submitted clarifying the need for another Elementary School in the Kailua-Keauhou area.

We have noted that $126,000 has been released to date for land acquisition to expand the Holualoa Elementary School site to 9.5 acres. It is our understanding that this expansion was to provide for a design capacity of 700 students by 1990. As it appears that Holualoa Elementary and the proposed Kailua-Keauhou Elementary would service approximately the same area, we believe that this could create an expensive and unnecessary overlap in Educational facilities. Therefore, we are requesting that the need for Kailua-Keauhou Elementary be further justified and that additional information be submitted as to the current status of Holualoa Elementary and future plans, if any, for expansion or phasing out.

We will be most happy to expedite the processing of your request with our appropriate recommendations upon receipt of the above information.

GEORGE R. ARIYOSHI
GOVERNOR

TEICHIRO HIRATA
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

March 12, 1975

MEMO TO: Honorable Hideto Kono, Director
Department of Planning & Economic Development

F R O M: Teichiro Hirata, Superintendent
Department of Education

SUBJECT: Kailua-Keauhou Elementary School Site Selection
North Kona, Hawaii - DAGS Job No. 01-16-6734
As Authorized by Act 218, SLH 1974, Item G-35

Your letter of February 3, 1975 requested additional justification for the subject site study and information on the status of Holualoa Elementary.

Our updated plans for Holualoa are to retain a "status quo" situation and to periodically evaluate the need to retain the school. The school will continue to serve the mauka residential strip along Mamalahoa Highway but will drop Grades 7-8 to Kealakehe Intermediate. Please refer to our attached letter to DAGS for additional details.

Kailua-Keauhou Elementary will not serve the same geographical area as Holualoa Elementary. As indicated in our site selection request, the service area will include approximately 200, K-6 students from existing housing in the makai area plus an additional 300 students anticipated by 1990. There will be no overlap with the existing Holualoa service area.

We fully support careful periodic review of CIP needs on an area basis rather than reviewing in isolation the needs of individual schools. Our current evaluation is that CIP funds available for the Kona area for the next several years should be concentrated on developing Kailua-Keauhou Elementary while adopting a "wait and see" approach for needs at Holualoa.

We hope the additional information will assist your processing of the site selection request.

Attachment

(P)2433.5

NOV 5 1975

Mr. Edward Harada
Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street
Hilo, Hawaii

Dear Mr. Harada:

Subject: Kailua-Keauhou Elementary School
Site Selection Study

We have initiated a site selection study for a new elementary school in Kona for the DOE. The attached map shows the proposed school service area and the alternative sites under consideration. The sites were selected for evaluation by considering all possible sites and eliminating those which did not meet the following minimum criteria:

1. Within school service area.
2. Within or adjacent to Urban zoned land.
3. Outside potential tsunami inundation zone.
4. Outside potential flood plain.
5. Accessible from existing or proposed roadway.
6. Under 12% slope.
7. Minimum displacement of residents.

We have also conducted a preliminary investigation of the selected alternative sites with the County Planning Department. In order to proceed with a detailed analysis of the alternative sites, we need to know the schedule and plans for improvements by the Hawaii County which affect these sites. Your assistance is therefore requested to determine the following:

1. New Alii Highway

   a. Schedule for construction and completion.

b. Plans for utilities (water, sewer) within the new road right-of-way.

2. Existing Alii Drive

a. Schedule for improvements, if any.

b. Existing and proposed right-of-way.

3. Other Roadways

a. Plans and schedule for interconnecting roads between existing Alii Drive and the new Alii Highway.

b. Plans and schedule for interconnecting roads between new Alii Highway and Kuakini Highway.

4. Holualoa Drainage System (Ord. No. 586)

Plans and schedule for construction of channel improvements.

5. Proposed Developments

Plans and schedule for public and private projects within the school service area (sewer, water, housing, etc.)

We would also appreciate your comments on the alternative sites to assist our evaluation. If you have any questions, please have your staff contact Mr. Harold Senomura of my staff at 548-5703.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt
Attachment
cc: Mr. R. Suefuji w/attachment

(P)2435.5

NOV 5 1975

Mr. Akira Fujimoto
Manager
Department of Water Supply
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Fujimoto:

Subject: Kailua-Keauhou Elementary School
Site Selection Study

We are conducting a site study for a new elementary school in the Kailua-Kona area. The attached map shows the alternative 10-acre sites which are being evaluated for the proposed school. The school will be designed for 550 students in grades K-6 and is tentatively scheduled to open in 1980.

Your assistance in determining the following water supply requirements for each alternative site is requested:

1. The existing water system available at each site and the adequacy of the system.

2. The scope of any water improvements required for each site before development of a school can proceed.

The above information will be used to evaluate the alternative sites along with other factors. Please have your staff call Mr. Harold Sonomura of my staff at 548-5703 if there are any questions.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt
Attachment
cc: Mr. E. Harada
Mr. R. Suefuji

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII
P. O. BOX 1820 • HILO, HAWAII 96720 25 AUPUNI ST

RECEIVED
Nov 20 10 44 AM '75
PUBLIC WORKS DIV.
DAGS

November 17, 1975

Mr. Rikio Nishioka
State Public Works Engineer
Dept. of Accounting & General Services
Division of Public Works
P. O. Box 119
Honolulu, HI 96810

Re: Kailua-Keauhou Elementary School
Site Selection Study

Thank you for the opportunity to evaluate the water requirements for the subject project.

First of all, please be aware of the current water situation in Kona. Present consumption is rapidly approaching the source capacities, which is why the Kahaluu Shaft is undergoing construction to remedy the situation. The total project is expected to be completed in late 1977. New developments which would require large water demands, such as a school, hotel, subdivision, etc., are presently being deferred until such time that water usage can be guaranteed, or that some kind of preliminary approval to the development may be granted. In view of the expected opening date of the school in 1980, it appears that no problems can be readily foreseen for the development of the school.

We are enclosing a map of the North Kona Water System with the alternate school sites plotted in red. With some improvements, such as water main extensions and replacement of small sized mains with larger mains, it appears that each site is accessible to our water system. For example, an extension of the waterline from Alii Drive or the Alii Kai Subdivision to Sites A, D or E will be required. Also, should Site B be selected, the 4-inch line on Alii Drive will have to be replaced with a 6-inch or an 8-inch line to meet fire flow demands.

In designing the network water system for the school site, please keep in mind the following:

1. Storage requirements for a school site is 6800 gallons per acre a day plus 3 to 4 gallons per student a day. Inasmuch as two (2) storage tanks will be constructed as part of the Kahaluu Shaft project, a storage tank, in access of 0.10-million gallon capacity, will not be required for the school.

... Water brings progress...

2. Fire flow shall meet a requirement of 1000 gallons per minute (gpm) for a 2-hour duration with a residual pressure of 20 pounds per square inch (psi). The minimum line size for a fire hydrant is 6 inches. For domestic flow, a minimum pressure of 40 psi is required.

3. Fire hydrants shall be installed at least 600 feet apart within the school site. Also, each building shall have easy accessibility to a hydrant.

4. Metering shall be separate for domestic use and fire protection, via standpipes or sprinklers. Preferably, master meters shall be installed to service a complex. Easy accessibility to the meters, pipelines and appurtenances shall be considered for the Department of Water Supply personnel for easy maintenance purposes.

5. Before granting of water services or assuming ownership of the water system by the Department of Water Supply, said water system, together with all necessary easements, must be dedicated to the Department in accordance with Section 4-10 of the Department's Rules and Regulations. All pipelines and appurtenances up to and including the meters must be dedicated. Anthing after the meter shall be kept private and be maintained by the developer.

Reiterating to the availability or non-availability of water due to the present Kona situation, please understand that approval to any subdivision or plan approval as may be required for the development shall be subject to the completion of the Kahaluu Shaft project. Should approval for the school development be required before the completion of the Kahaluu Shaft project, an agreement of understanding to the effect that water usage shall only be after said completion may be required to be filed.

Should you have questions or require further assistance, please do not hesitate to contact this office.

Akira Fujimoto
Manager

QA

Enc.

copy: Planning Department
Department of Public Works

HERBERT T. MATAYOSHI
MAYOR

EDWARD K. HARADA
CHIEF ENGINEER

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PUBLIC WORKS DIV.
DAGS

COUNTY OF HAWAII
DEPARTMENT OF PUBLIC WORKS
25 AUPUNI ST.
HILO, HAWAII 96720

BUREAUS AND DIVISIONS:
AUTOMOTIVE EQUIPMENT & MOTOR POOL
BUILDING CONSTRUCTION & INSPECTION
PLANS AND SURVEYS
ROAD CONSTRUCTION AND MAINTENANCE
SEWERS AND SANITATION
TRAFFIC SAFETY AND CONTROL

November 25, 1975

Mr. Rikio Nishioka
State Public Works Engineer
Department of Accounting & General Services
Division of Public Works
P. O. Box 119
Honolulu, HI 96810

SUBJECT: KAILUA-KEAUHOU ELEMENTARY SCHOOL
SITE SELECTION STUDY
RE: LETTER NO. (P)2433.5

This is in response to your November 5, 1975 letter. Depending on the economic situation and fiscal considerations, our approximate implementation schedules are as follows:

1. Alii Drive Realignment

   Begin Construction 1982
   End Construction 1983

   The present plans does not call for inclusion of utilities within the new road right-of-way.

2. Existing Alii Drive - Phase II

   Begin Construction . . . . . May, 1976
   End Construction . . . . . Oct., 1976

   The improvements are planned within the existing 50-foot right-of-way. No additional right-of-way to be acquired. Additional funds to be requested in the FY 1976-77 C.I.P. budget to complete improvement of Alii Drive under Phase III. Approximately one mile will remain to be improved.

3. No definite plans or schedules are projected at this time for the interconnecting roads between Alii Drive, New Alii Drive and Kuakini Highway.

4. A master drainage report has been completed for the Holualoa Stream on the conceptual basis of channeling from the upper reaches to the ocean for disposal of the flood waters. With the many concerns for our environment and pollution, this concept of flood water disposal method need to be re-studied and reconsidered for disposal by ponding areas with injection wells, which would be in consonance with the Water Resources recommendation for fresh water ground recharge.

5. We have no other capitol improvement projects for roads and drainage projected within the proposed school zone limits. Preliminary sewerage system master planning was done as shown on the enclosed drawing. We have no immediate plans for implementation.

We have no comments on the alternative sites, however, we would like to suggest that a school site located off from our highway system is preferable.

If we can be of further assistance in your site selection study, please do not hesitate to write or call us.

EDWARD HARADA
Chief Engineer

Enc.

(P)1730.6

JUN 30 1976

Mr. Tetsuo Harano
Chief
Highways Division
Department of Transportation
State of Hawaii
Honolulu, Hawaii

Dear Mr. Harano:

Subject: Kuakini Highway Realignment
Project No. RF-011-1(14)

Please be informed that we are currently conducting a site selection study for the proposed Kailua-Keauhou Elementary School. Enclosed is a preliminary map of the alternative sites under consideration for the school. Since several of the alternative sites will be affected by the existing Kuakini Highway, we would support a mauka realignment (Line 1) for the highway.

Our current schedule is to select a specific school site by the end of this year. We would therefore appreciate receiving your schedule for setting the alignment for the subject project to assist us with our study.

If you have any questions, please have your staff contact Mr. Harold Sonomura of my Planning Branch at 548-5703.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:dr
Attachment

GEORGE R. ARIYOSHI
GOVERNOR

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PUBLIC WORKS DIV
DAGS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

ALVEY WRIGHT
DIRECTOR

DEPUTY DIRECTORS
WALLACE AOKI
RYOKICHI HIGASHIONNA
DOUGLAS S. SAKAMOTO
CHARLES Q. SWANSON

IN REPLY REFER TO:
HWY-PA
2.29945

July 14, 1976

Mr. Rikio Nishioka
Public Works Engineer
Department of Accounting and
General Services
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Nishioka:

Subject: Kuakini Highway Realignment,
Island of Hawaii
Project No. RF-011-1(14)

Thank you for your letter and enclosure, dated June 30, 1976, informing us of the site selection study for the proposed Kailua-Keauhou Elementary School. As our proposed highway project may affect this school, we appreciate your early coordination.

A public hearing for the realignment of Kuakini Highway was held in Kailua-Kona, on July 8, 1976, and the State Department of Transportation recommended the construction of Line 1. A public notice will soon be published stating our preferred alternate and indicating preparation of the final environmental impact statement.

You may be interested to know that we are also planning a highway improvement extending from the Kilohana Subdivision to Papa. The proposed Hawaii Belt Road, Project No. F-011-1(8) is presently located mauka of the school sites, and consequently we anticipate no adverse effects.

HWY-PA 2.29945

If you have any questions regarding either of our projects, please contact our project manager, Mr. Kenneth Au, at 548-3830.

Very truly yours,

T. HARANO
Chief
Highways Division

APPENDIX D

ENVIRONMENTAL IMPACT STATEMENT

SUMMARY

The Kailua-Keauhou Elementary School project consists of the selection of the most suitable site within the Kailua-Keauhou vicinity for a new school. The school is tentatively planned to encompass about 7 acres of land and will provide classrooms, support facilities, and playground areas for a design enrollment of 630 grades K-6 students. The EIS discusses the environmental effects of the ten (10) alternative sites which were considered in the draft site selection study.

The school development will serve the projected overflow of students at Kealakehe School caused by the new housing construction in North Kona. The proposed school may encourage additional residential developments by providing adequate public education facilities conveniently located in the Kailua-Keauhou vicinity. The new school is not expected to affect the existing Holualoa Elementary School which will continue to serve the students along the mauka Mamalahoa Highway.

The environmental effects of the proposed school development are not considered to be major and will be minimized by enforcement of adequate control measures. The alternative sites will be reviewed by affected government agencies, individuals and community groups to resolve any environmental concerns before a specific school site is recommended.

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ENVIRONMENTAL IMPACT STATEMENT
KAILUA-KEAUHOU ELEMENTARY SCHOOL
SITE SELECTION

DESCRIPTION OF PROJECT AND SITE SELECTION PROCEDURE

This project consists of selecting a 7-acre site for the proposed Kailua-Keauhou Elementary School in Kona on the Island of Hawaii. The project location and service area for the school are shown on Exhibits A and B, respectively. The service area was established by the Department of Education to delineate the geographic boundaries for students who will be attending the new school and to define the limits within which the school site must be located. The details of the project scope, need, student enrollment, and location are contained in Chapter 1 of the draft site selection study to which this EIS is appended.

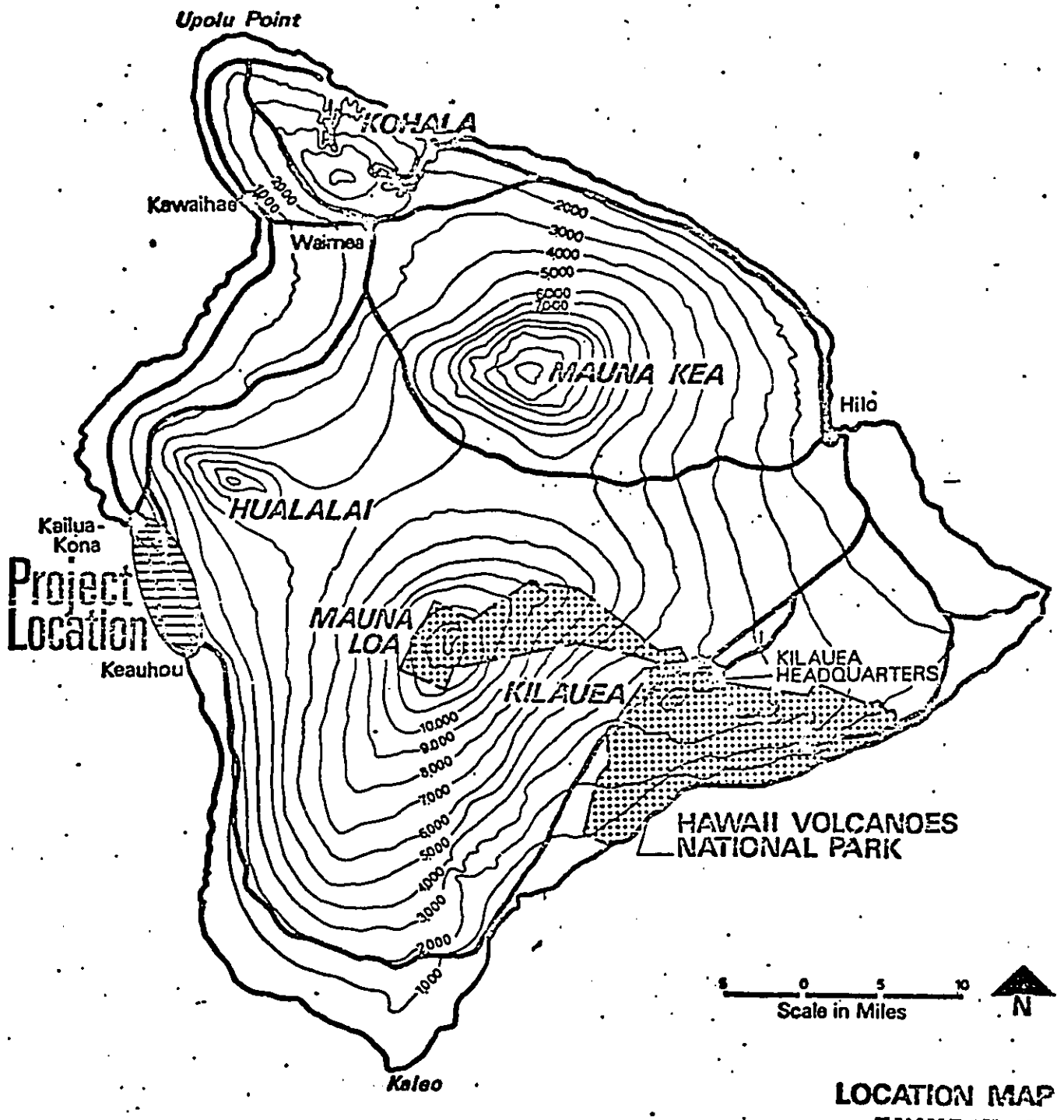
Chapters 2 and 3 of the site selection report describe the methods used in selecting the ten (10) alternative sites shown in Exhibit C and also provide specific details on each site. Each of the ten (10) alternative sites were then evaluated against a set of evaluation criteria and the results tabulated and summarized in Chapter 4 of the report. Finally, the comparative cost data for developing each alternative site for a school was computed in Chapter 5.

The draft site selection report and EIS was circulated to various governmental agencies, community organizations, and concerned individuals to solicit their comments during the EIS consultation phase. The site selection report and EIS was then revised to incorporate the review comments and to resolve any environmental, social, and technical concerns satisfactorily. The site selection report and EIS will then be formally circulated by the Environmental Quality Commission for public review in accordance with established procedures before it can be finalized. A specific school site will be recommended to the Governor for his approval after the EIS is accepted.

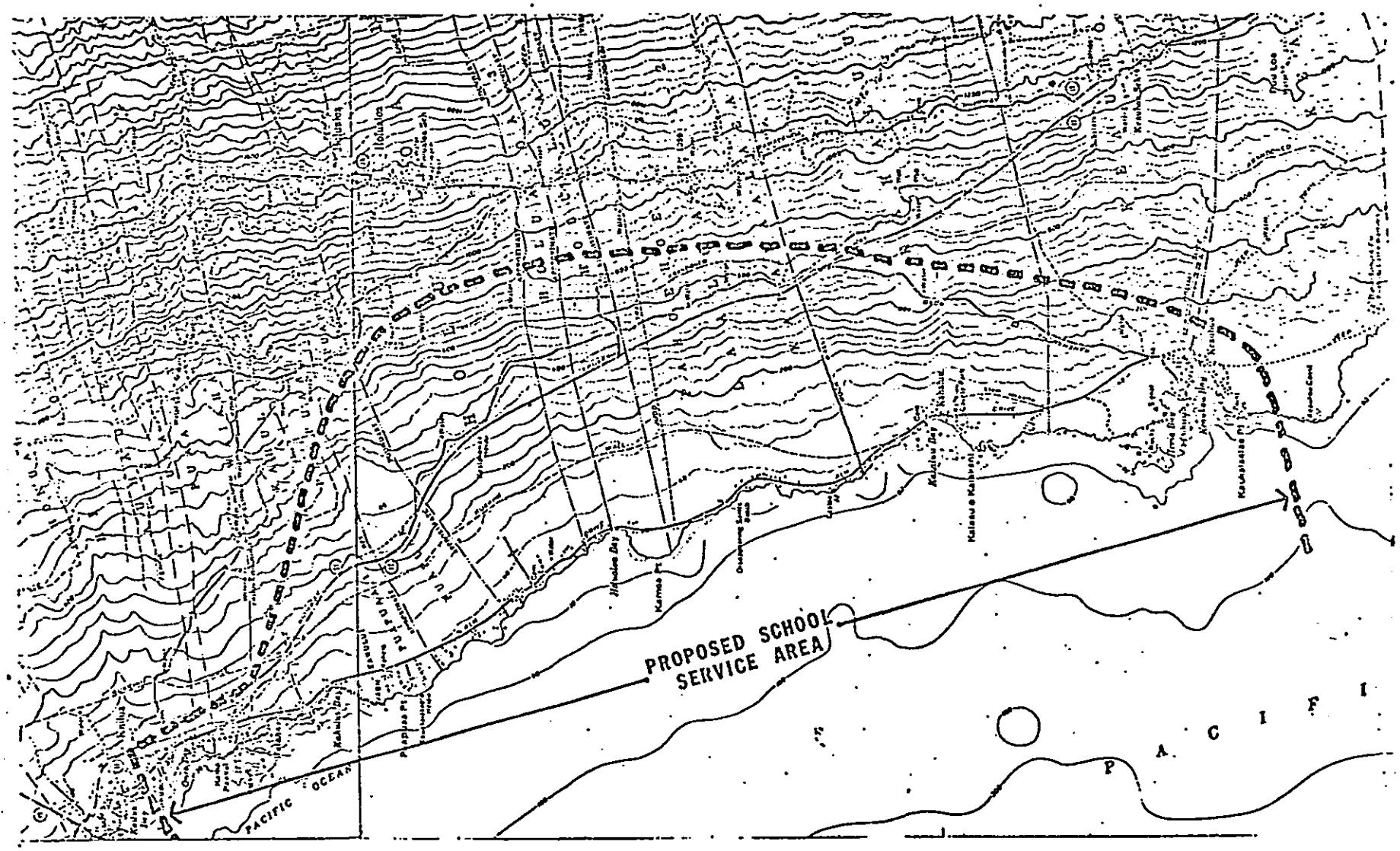
The land acquisition, planning, and construction phases will commence after receipt of the Governor's concurrence. The current timetable tentatively requires approval of the school site by mid-1977 to meet the scheduled opening date of September 1980.

DESCRIPTION OF ENVIRONMENTAL SETTING

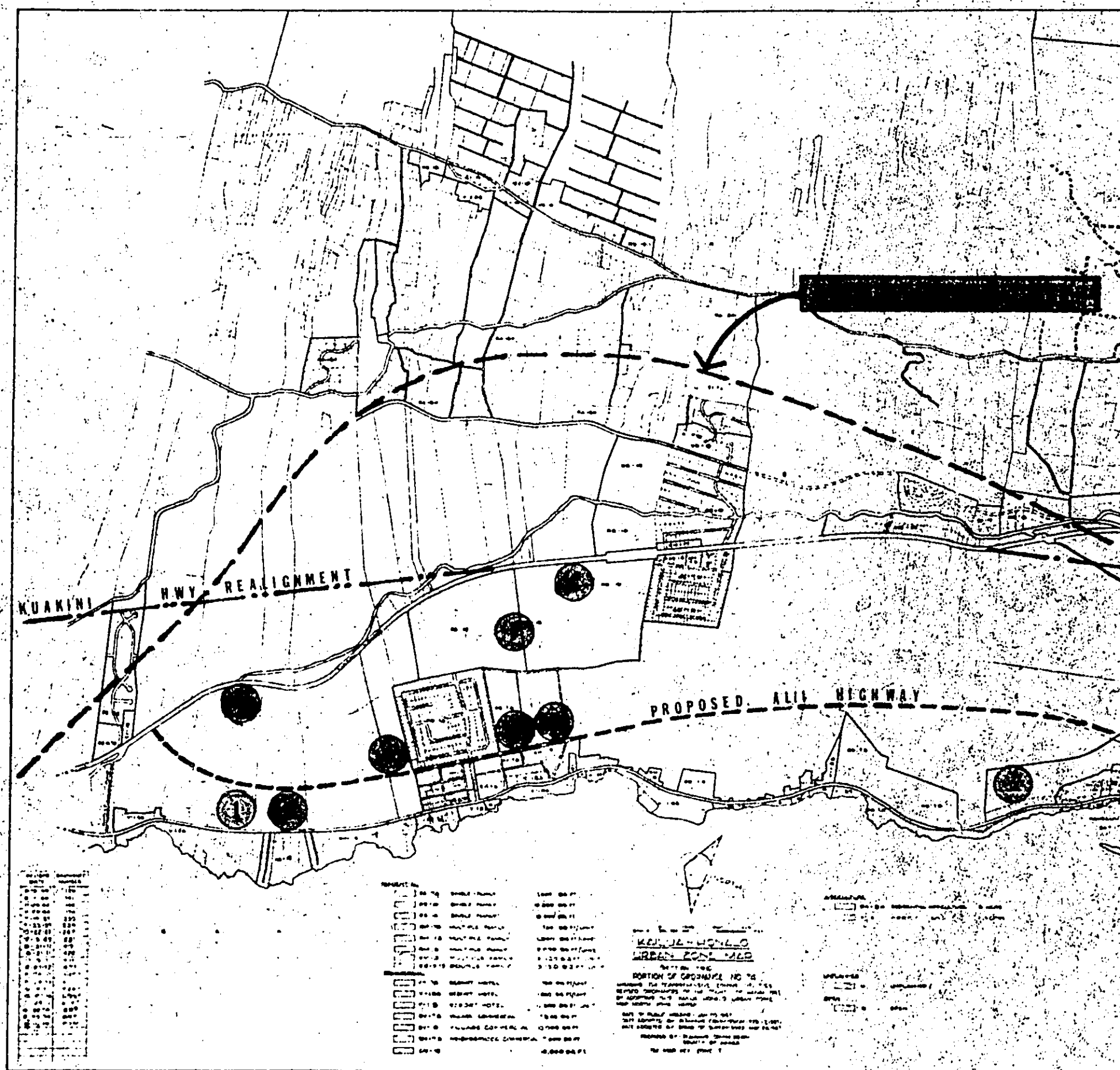
The school service boundary shown on Exhibit B generally encompasses the area between Kailua Town and Keauhou Bay. This service area consists of approximately 50% urban and 50% agricultural zoned lands as shown on Figure 35 - State Land Use District Map, Figure 36 - County General Plan, and



LOCATION MAP
EXHIBIT A



Kailua-Keauhou Elementary
EXHIBIT B


KUAKINI HWY REALIGNMENT
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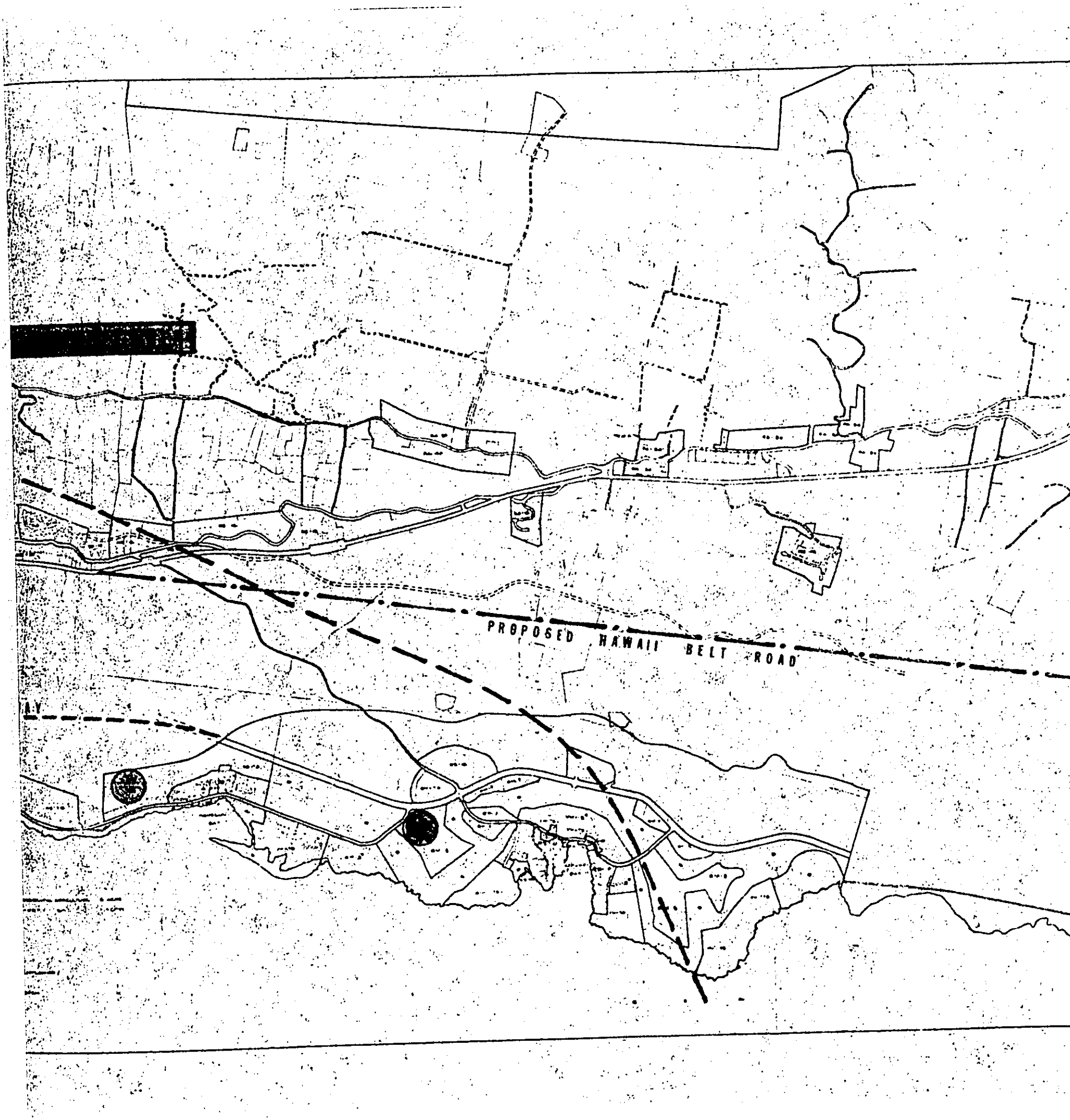
PROPOSED HAWAII BELT ROAD

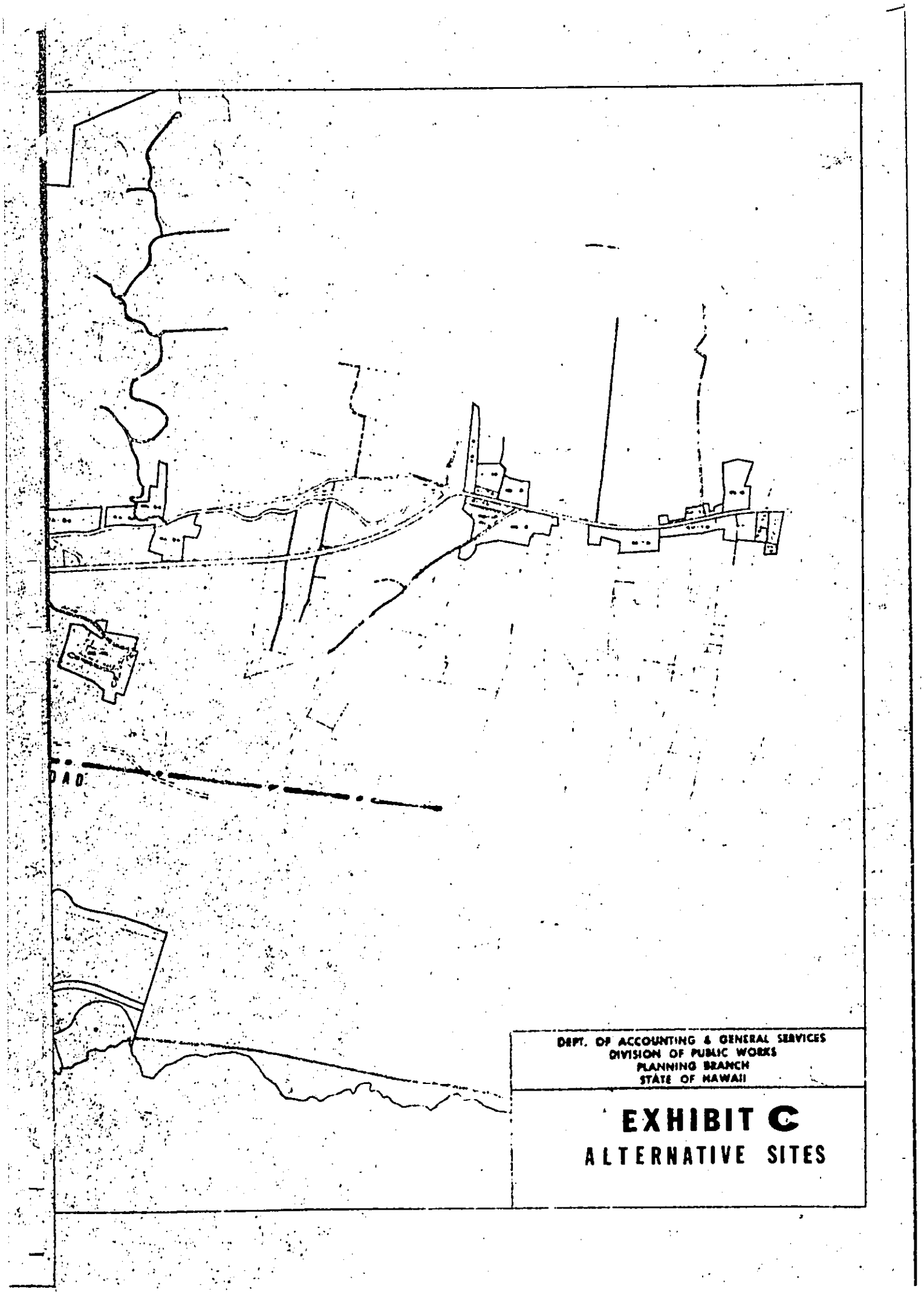
DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
PLANNING BRANCH
STATE OF HAWAII
EXHIBIT C
ALTERNATIVE SITES

Figure 37 - County Zoning Map in the site selection report. The coastal urban lands along Alii Drive are characterized by resort and residential developments. Residential subdivisions are scattered in the mauka area along Kuakini Highway. However, the bulk of these lands are presently used primarily for grazing or are otherewise undeveloped.

The slope of the service area averages 10% in the mauka section and tapers to 5% or less along Alii Drive, which follows the shoreline. The soil condition in the vicinity between Kailua and Kahaluu is stony, shallow, and underlain by bedrock or pahoehoe lava at depths of 1.5 feet or less. The soil in the Keauhou area, however, consists primarily of Aa lava.

The rainfall is fairly light, ranging between 30 to 40 inches annually in the vicinity of Kailua and Keauhou. The predominant vegetation commonly found in this area consists of haole koa, kiawe, opiuma, Christmas berry, lantana, and common pasture grasses. The future use of the land is moving towards resort and residential developments and away from marginal agricultural activities.

The school service area is susceptible to flooding conditions in the vicinity between Holualoa to Kahaluu as shown in Figure 38 - Flood Prone Areas in the site selection report. Accordingly, the alternative sites have been selected to avoid these potentially hazardous areas.

The Kona District is noted for its abundance of historical sites. The Kailua-Keauhou section is typical, as indicated by the number of historical sites identified on Figure 39 of the site selection study. Two of the major historical sites include the Great Wall of Kuakini, which traverses the school service area from Kailua to Keauhou, and the Kahaluu Historical District near Keauhou. The ten alternative school sites were selected to avoid disrupting known historical sites. A detailed archaeological reconnaissance survey of the four "best" sites A, B, F and 1 was conducted by B. P. Bishop Museum for the State. The survey is included in Appendix III of this EIS and the results of the survey is included in the discussion of the impact of the action upon the environment.

Other significant current factors which may affect the existing environmental setting of the Kailua-Keauhou vicinity are the proposed roadway alignments for the area which are shown on Exhibit C. Hawaii County is planning the construction of Alii Highway from Keauhou towards Kailua and has adopted the mauka alignment which parallels Alii Drive.

The State Department of Transportation (DOT) has tentatively adopted a mauka realignment of Kuakini Highway from the end of the new Queen Kaahumanu Highway at Palani Road to the

vicinity of Kealakowaa Heiau on Kuakini Highway. The State DOT is also studying alternate mauka and makai routes for the proposed Hawaii Belt Road from Kealakowaa Heiau towards South Kona. The proposed Alii Highway may have a major impact on the future development of the Kailua-Keauhou area including the selection of the proposed school site. The proposed Kuakini Highway realignment and Hawaii Belt Road would affect the mauka portion of the school service area and may have some effect on the alternative school sites.

Air pollution from motor vehicle emissions is not expected to have any significant impact on the local air quality. The Department of Health's analysis for the Kuakini Highway Realignment project indicates the estimated daily and peak hour emission rates for carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxide (NOx) would decrease between 1975 to 1985 without the proposed highway improvements. Implementation of the proposed improvements shown in Exhibit C would further decrease the CO and HC emissions but would increase the NOx emissions. This increase in NOx emissions would not have a significant impact on overall ambient air quality. 1/

The anticipated exterior L_{10} traffic noise levels during 1995 peak hour conditions are 75 and 81 dBA for two locations along the existing Kuakini Highway and 64 dBA for one location adjacent to the proposed Kuakini Highway Realignment. The values were computed by the State Department of Transportation using the National Cooperative Highway Research Report No. 117 "Highway Noise - A Design Guide for Highway Engineers". 2/

RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AFFECTED AREA

The need for the new school site has been fostered primarily by the existing land use plans which encourages resort and residential growth in the Kailua-Keauhou area. The emphasis towards the visitor industry has spurred resort and recreational construction projects. This created employment opportunities which, in turn, caused the in-migration of workers and a corresponding increase in student enrollment. The establishment of the new school itself may stimulate further residential development in the area by providing adequate school facilities which are conveniently located within the area.

The alternative sites being considered for the new school were carefully evaluated with respect to the existing land

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1/ July 18, 1974 letter from Dr. Walter Quisenberry, Department of Health Director to E. Alvey Wright, Department of Transportation Director.

2/ Draft EIS prepared by the State Department of Transportation for the Kuakini Highway Realignment Project No. RF-011-1(14) and distributed March 8, 1976.

use plans to maximize their compatibility with the environment. For example, all of the sites were selected within or adjacent to urban zoned lands to avoid the creation of non-contiguous spot zoning conditions. The alternative sites were then individually evaluated against the State Land Use, County General Plan, and County Zoning regulations in the site selection report. The results of this evaluation have shown that not all of the sites were suitable for school development without amendments or variances from the existing land use controls in effect. The alternative sites and their conformance or non-conformance with the existing land use controls were extracted from the site selection study and listed in Table 1.

TABLE 1
CONFORMANCE WITH LAND USE CONTROLS

Site	SLU	General Plan	Zoning	Shoreline Protection
A	Conforms	Conforms	Conforms	In
B	Conforms	Non-Conformance	Conforms	In
C	Conforms	Conforms	Conforms	Out
D	Conforms	Conforms	Conforms	In
E	Non-Conformance	Non-Conformance	Conforms	In
F	Conforms	Conforms	Conforms	Out
G	Conforms	Conforms	Conforms	Out
H	Conforms	Conforms	Conforms	In
1	Conforms	Non-Conformance	Conforms	In
2	Conforms	Conforms	Conforms	In

Based on the above, Alternative Sites B, E, and 1 may require amendments to the existing land use controls if they are developed for the new school. Additionally, Alternative Sites A, B, D, E, H, 1, and 2 which are located within the shoreline protection area will be subject to additional design controls by the County. The primary intent of this land use control is to preserve, protect, and where possible, to restore the natural resource of the coastal zone of Hawaii.

PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

A. Technical

The scope of the project consists of acquiring approximately 7 acres of land and constructing and operating an elementary school on the site. For the projected design enrollment of 630 students, the Kailua-Keauhou Elementary School will require the following facilities in accordance with the DOE's "Educational Specifications, Policies, and Design Standards for the Public Schools of Hawaii":

Administration	2,350 sq. ft.
Library	3,415 sq. ft.
Kitchen	2,180 sq. ft.
Multi-Purpose Dining	3,641 sq. ft.
Classrooms	(20) 960 sq. ft. Regular
	(1) 1,050 sq. ft. Special Education
	(1) 1,200 sq. ft. Art
	(1) 1,200 sq. ft. Music
	(1) 1,200 sq. ft. Science
Parking	44 Stalls (County Ordinance)
Playground,	5,000 sq. ft. Kindergarten
Paved Courts &	31,000 sq. ft. Grades 1-3
Apparatus	105,000 sq. ft. Grades 4-6

Construction of the school will alter the conditions of the selected site through: (1) clearing and grading, (2) installing the necessary access roads and utilities such as water, sewer, drainage, and electrical systems, and (3) constructing the school buildings and play facilities. This proposed construction may have some positive and negative secondary effects on the properties adjacent to the school site. These effects are as follows:

1. The school access road will generate additional vehicular and pedestrian traffic. However, the extension or widening of existing roads should correspondingly improve access to adjacent properties.

2. The extension of utilities to the school site may increase the development potential of some abutting properties which can also be serviced by the same utility improvements.

3. The establishment and operation of the school may be acceptable to nearby stores and residents with school-age children. Conversely, some nearby businesses and residents may object to a school on the grounds that the school children may disturb the residents or restrict certain types of business activities near the school.

4. The school development may raise the surrounding property values or may restrict the future development potential of adjacent properties.

B. <u>Economic</u>

The school development may have some impact on the growth of the Kailua-Keauhou area by providing additional public service capability. Since the existing elementary school serving this area is reaching its

design capacity, the new school will provide relief, allow for future enrollment increases, and reduce the bussing cost and travel time.

The comparative development costs for the alternative sites were computed in Chapter 5 of the site selection study. The comparative costs for land acquisition, on-site and off-site developments, and bussing subsidy ranged from a low of $1,437,500 for Site G to a high of $2,552,700 for Site H. An additional $4 to $5 million dollars would be required for construction of the school buildings and play facilities at each alternative site. The total estimated expenditure of $5.5 to $8 million dollars for the development of the new school will provide employment initially during the construction phases and provide subsequent employment for administration, faculty, service, and maintenance personnel to operate the school.

Acquisition of 7 acres for the school site will remove land from the tax base. However, the benefits of the new school may result in increased property values near by which may off-set the loss of tax revenue from the 7-acre site. The development of the 7 acres would also remove land from grazing or other agricultural activity. This effect is expected to be minimal, since the land is rated as having very poor agricultural productivity by the University of Hawaii.

It is anticipated that the State would provide the funding for the school. However, some of the capital costs may be shared by the County and/or private land developers who would also benefit from the improvements.

C. Social

The proposed elementary school will provide additional benefits to the Kailua-Keauhou community by providing a convenient location to receive an education. The school's classrooms, multi-purpose room, and play facilities will also be available for use by the community during non-school hours.

The new school will increase public safety by reducing the bussing distance to the existing Kealakehe and Holualoa Schools. The school will also be planned to minimize hazardous traffic conditions by providing adequate school bus and vehicular loading zones and turn-around areas. Sidewalks, crosswalks, and traffic control measures will be incorporated in the school development for pedestrian and vehicular safety.

The alternative school sites do not require the displacement of business establishments or farms. Only

Alternative Site G will require the displacement of a dwelling unit if it is selected for the school site. A resident who is displaced by the project will qualify for relocation assistance and payments to minimize the hardship of moving. A conceptual relocation plan which identifies the relocation assistance available will be prepared if this site is selected.

Other social effects which may result from the school development have been evaluated with respect to each alternative site and have been incorporated in the site selection report under "Community Site Criteria". Since the need for the school is established by the development of the community, the social benefits to be gained should outweigh any adverse social effects.

D. Environmental

1. Flora

The types and degree of existing flora of the alternative sites are generally similar except for Site H, which has sparse scrub growth over Aa lava. The overgrowth consists of kiawe, haole koa, opiuma, Christmas berry, guinea grass and other grasses and weeds. Based on the comparable flora of the surrounding areas, it is unlikely that any rare or valuable plants will be destroyed by the school development. The loss of vegetation by the clearing and grading of the 7-acre site should be offset by the grassing and landscaping of the school campus. Existing trees which are desirable will be incorporated in the landscape plans where possible or transplanted.

2. Fauna

The fauna of the area consists of introduced species which are common throughout the Kona District. These consist of rats, mice, mongoose and stray cats. Some common birds such as mynah, dove, sparrow, and cardinal also inhabitate the area. Development of the school site will remove about 7 acres of feeding and breeding grounds for rats and mongoose. However, this impact should be negligible. The loss of trees for nesting and feeding of the birds will have a temporary adverse effect until the school landscaping is planted and matured.

3. Aesthetic

The terrain of the alternative sites evaluated for the proposed school are typical of those in the

surrounding Kailua-Keauhou vicinity. The sites do not contain significant natural landmarks which would be affected by the school development. The design of the school buildings will be coordinated with the character of the surrounding community to provide an aesthetically pleasing campus. The buildings will probably consist of single story administration, library and cafetorium buildings and one or two-story classroom buildings. Based on the above, no adverse effects are anticipated on the scenic vistas or natural beauty of the project location.

4. Water Quality

The coastal waters between Kailua Bay and Keauhou Bay are classified as Class A waters under the State Department of Health's Water Quality Standards. The uses to be protected in this class of waters are recreational, aesthetic enjoyment, and the support and propagation of aquatic life. The school development should not adversely affect the water quality of the area based on the following:

a. The alternative sites are located from 800 to 3,200 feet from the shoreline.

b. The alternative site selected will have a sewage disposal system which meets the Department of Health's regulations for sewage treatment and disposal systems.

c. The alternative sites are located one mile or more from the Waiaha and Kahaluu water supply wells which were shown in Figure 41 of the site selection report.

5. Air Quality

The school development is not expected to have a significant effect on the air quality of the district. There may be some dust and noise pollution during the construction phases. However, these nuisances will be temporary and strictly controlled to comply with the requirements of Chapter 43 - Air Pollution Control, Public Health Regulations, State Department of Health. The prevailing winds in the Kona District are land and sea breezes because the large mountain mass blocks the prevailing northeast tradewinds from coming over the mountain. The lighter winds combined with the predominately lava type soil should minimize dust pollution during construction.

6. Solid Waste

Solid waste generated during the site preparation and construction phase of the project will be removed and disposed of in compliance with Chapter 46 - Solid Waste Management Control, Public Health Regulations, State Department of Health and County rules and regulations. Solid wastes generated during the maintenance and operation of the school will be properly stored in trash bins and removed regularly for disposal at an approved site.

7. Noise Pollution

Development and operation of the school is not expected to create excessive noise pollution. Construction noise will be unavoidable. However, it will be controlled by the Department of Health regulations and will be temporary and intermittent. Other noise sources include students, cafeteria operations, and grounds maintenance. These periodic disturbances should be minor and within the limits of human tolerance.

8. Drainage

The alternative school sites are outside of the flood prone areas shown on Figure 38 of the site selection study. Since the sites are located in a relatively low rainfall (30" to 40" median annual) area with highly permeable soils, the on-site drainage runoff from the school facilities can be disposed of by natural percolation and by the use of dry wells. Alternative Site D will require some off-site drainage improvements to channelize the mauka runoff from Holualoa Stream along the school boundary to prevent flooding of the site.

9. Traffic

The school development will inevitably increase the vehicular traffic on the access roads surrounding each alternative site. For this reason, the accessibility of each site was carefully evaluated in terms of pedestrian, vehicular, bussing, safety, and traffic. The access roads will be improved if necessary to provide adequate capacity for the school traffic. The on-site school development will also provide sufficient parking, loading and turn-around areas to ensure vehicular and pedestrian safety. Appropriate traffic controls such as signs, crosswalks, and barriers will be incorporated in the design of the school.

10. Public Utilities

The alternative sites will be provided with the necessary electrical, telephone, gas, and water services for school development. The electrical and telephone services will be extended from nearby transmission lines. The gas service for the school will be provided by using refillable propane or methane storage tanks on the site. The water service will be extended to the site from the closest available main. The existing and planned capacities of these utilities should be adequate to accommodate the school without need for major expansion.

11. Fire Protection

The alternative sites will be served by the Kailua Fire Station which is located on Palani Road near the intersection of Queen Kaahumanu Highway. The school campus will also be provided with adequate fire protection in terms of fire resistive construction, fire alarm systems, fire extinguishers and fire hydrants.

12. Historical Sites

The alternative school sites were selected to avoid any known historical sites of significant value which were identified in Figure 39 of the site selection study. After evaluating the ten alternative sites, the four "best" alternative sites A, B, F and 1 were selected for further detailed analysis. B. P. Bishop Museum was contracted by the State to conduct an archaeological reconnaissance survey of these four alternative sites. The archaeological survey is included in Appendix III of this EIS and a discussion of the significant findings follows:

Site A - This site contains some archaeological features. However, there appears to be extensive historic-era modifications. If this site is selected, it would be necessary to accurately locate the four items identified in the survey and conduct some test excavations to mitigate potential adverse effects of the school construction.

Site B - This site had the highest number of archaeological features. Should the site be selected, it will be necessary to: (1) locate and map all sites; (2) conduct limited subsurface testing of certain sites; and (3) conduct full-scale salvage excavations of Site D7-17. It was

strongly recommended in the study that salvage excavation of Site D7-17 precede any modification of the site.

Site F - A heiau was located on the site. The Museum has recommended that Site F be rejected as a potential school site for this reason and that further work at this location be directed towards restoration of the platform.

Site 1 - This site had the least signficant amount of archaeological features and is the most acceptable site from an archaeological standpoint. However, the archaeological site remnants should be accurately plotted and sketched prior to construction.

13. Climate

Although the island of Hawaii lies within the tropics, its climate is semi-tropical and varies locally with elevation and orientation to the tradewinds. In general, the climate is characterized by two seasons a year, by mild and fairly uniform temperatures except at higher elevations, by prevailing tradewinds, by marked differences geographically in rainfall patterns, and by typically humid and cloudy conditions except in leeward coastal areas and at higher elevations.

14. Temperature

Temperature depends almost entirely on elevation, although affected somewhat by slope, wind exposure, and cloud cover. Thus, regular sequences are characteristic of monthly temperatures on the island of Hawaii. Mean temperature on the island of Hawaii is graphically depicted in Exhibit D. The spaces between isotherms (lines of equal temperature) from the coast to mountain peaks indicate the decrease of mean temperature with elevation.

Records show that the mean and daily temperatures decrease at an approximate rate of 1° F for each 300 feet increase in elevation, the rate being somewhat greater at the lower elevations. This uniform rate of temperature change is usually halted or reversed between the 5,000 or 7,000-foot elevation. This "temperature inversion" is generally associated with tradewind air circulation, warm air rising at the equator, flowing toward the North Pole above the inversion level, and returning below the inversion level from the northeast

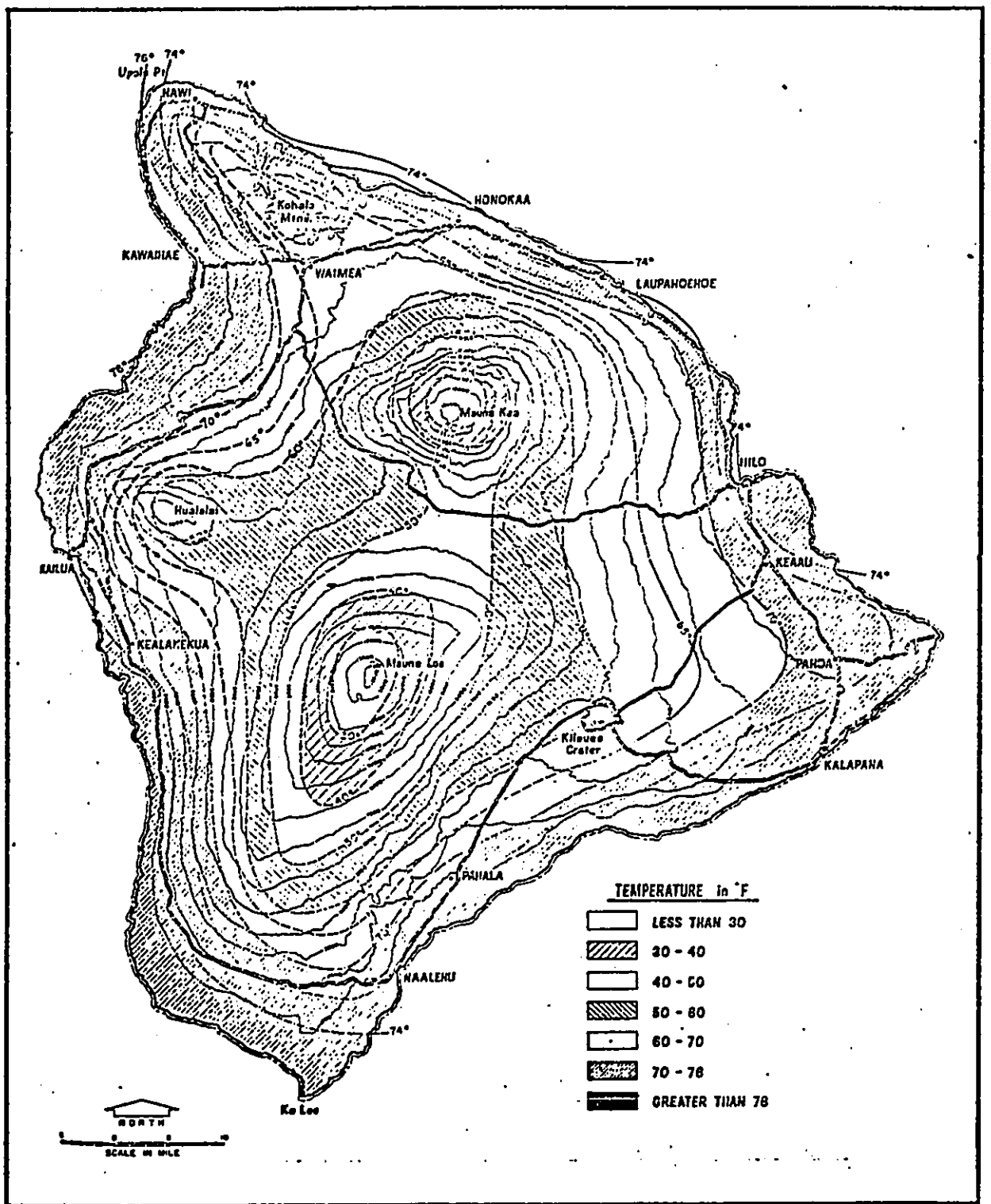


EXHIBIT D	MEAN TEMPERATURE
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH

because of the earth's rotation on its axis. The ceiling of tradewind clouds is generally at the inversion level.

Because of the mild, equable temperatures of the ocean waters surrounding the island, temperatures in the air moving across the ocean and over the island are also mild and equable. The range of mean monthly temperatures from summer to winter is slight and the mean annual temperature variations are also slight. Temperatures above 90° F are very unusual, except in the dry leeward area of South Kohala and temperatures less than 55° F are uncommon except at elevations above 2,500 feet. Table 2 shows the monthly mean maximum temperatures at selected stations in the Kona area:

TABLE 2
TEMPERATURE AT SELECTED STATIONS

Station	Elevation	Monthly Mean Maximum Temperature											
		J	F	M	A	M	J	J	A	S	O	N	D
Kona Airport	15	80.8	80.6	81.0	81.7	82.1	82.6	83.6	84.6	84.8	84.4	83.1	81.4
Napoopoo	400	79.6	79.9	80.8	81.7	81.9	82.6	83.6	84.4	84.3	83.5	82.0	80.4
Holualoa	1450	75.6	75.4	75.2	75.4	76.1	76.3	77.9	78.8	78.4	79.0	78.5	76.9
Kainaliu	1500	77.2	77.5	77.1	77.1	77.1	77.4	79.3	80.1	80.4	80.4	79.2	77.5

SOURCE: An Inventory of Basic Water Resources Data, Island of Hawaii, Report R34, State of Hawaii, Department of Land and Natural Resources, February 1970.

Based on the above, it is anticipated that the maximum temperatures at the alternative school sites which are located from 50 to 300 feet elevation would be somewhere between the temperatures recorded at Kona Airport and Napoopoo.

15. Humidity

Humidity measurements are expressed in relative terms by comparing the volume of moisture in the air to the volume in totally saturated air. Under prevailing tradewind conditions, from 50 to 70 percent of the time, moisture distribution in the air surrounding the island mass is greatly influenced by the characteristic temperature inversion. Relative humidity below the inversion is roughly 70 to 80 percent in the drier leeward areas. Above the inversion, relative humidity is generally less than 40 percent, often declining to 10 or even 5 percent.

16. Wind

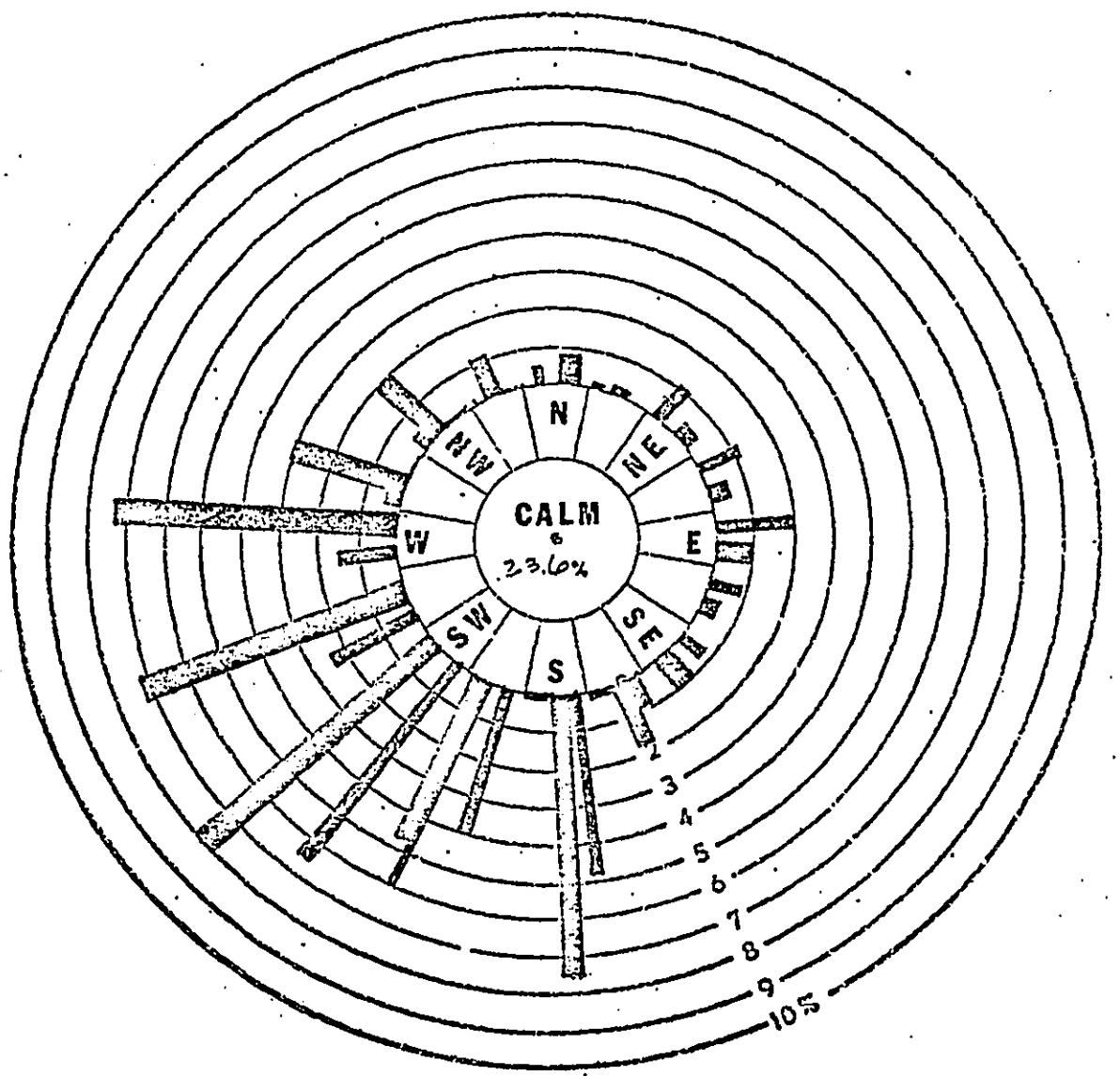
Northeasterly tradewinds prevail most of the year on the island of Hawaii, as elsewhere in the State. The tradewinds are forced around Mauna Loa and Mauna Kea by the high mountain masses and the characteristic inversion level and lose velocity laterally along the slopes with distance from the northeasterly impact area. Although these winds approach the island at a fairly constant speed, the uniform flow is distorted as the tradewinds traverse the island and combine with local winds on the mountain slopes and lowlands to form complex wind patterns. The wind patterns for the Kona District is graphically indicated on the windrose for the old Kailua-Kona Airport shown on Exhibit E.

During the cooler winter months the trades are usually replaced by other general winds, primarily the southerlies. Occasional tropical storms also generate winds from various directions. The wind pattern is a key factor in the determination of rainfall and affects humidity, evaporation, and temperature. Average wind speeds over the ocean surrounding the island are highest during the summer tradewind period, exceeding 12 miles per hour 50 percent of the time. However, occasional high winds with speeds exceeding the summer trades occur during the winter months.

17. Rainfall

The moisture-laden trades are cooled as they rise up the mountain slopes of Mauna Loa and Mauna Kea and lose part of their moisture as rain. The tradewinds which must go around Mauna Loa and Mauna Kea do not reach most of the Kona District and therefore cause only minimal orographic rainfall. However, the difference between land and water temperatures along the Kona coast on warm days, particularly in summer, generates moderate seabreeze circulation which results in showers. This rainfall is typically spotty in distribution and highly variable in duration and intensity, but the showers are frequent and heavy enough to produce a much higher mean rainfall in Kona than in other leeward areas.

Relatively infrequent but significant cyclonic disturbances disrupt the prevailing tradewind circulation and cause heavy rainfall. These disturbances, locally called "Kona Storms" usually occur during the winter months, are accompanied by



LEGEND: MPH

- 3 - 7
- 8 - 18
- 19-24
- OVER 24

Based on Daytime Observations (approximately 7:00 am to 5:00 pm)

Period of Record
1957-65

Source
Honolulu U.S.W.B.

EXHIBIT E	ANNUAL WIND DIAGRAM - KAILUA-KONA AIRPORT

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

winds from a southerly-southwesterly direction, and often account for most of the annual rainfall in the areas leeward of the mountain masses.

The rainfall map of the island of Hawaii shown in Exhibit F indicates the mean rainfall for the alternative sites will vary from 30 to 40 inches and the rainfall distribution throughout the year is fairly even.

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The school development will commit 7 acres of presently undeveloped land for urban use for as long as the school is needed. In the event the school is closed, the land will probably be used for other public functions. Based on the above, it is highly unlikely the land will be restored to a natural state. This commitment of land for higher use is unavoidable, but not deemed to have a major adverse impact on the environment.

Some minor adverse impacts such as noise, dust, and water pollution may occur during the construction phases. However, these effects will be temporary and will be strictly controlled by enforcing applicable pollution control measures. Other long term adverse effects would be the traffic generated by the school, some noise pollution, solid waste generated, and the consumption of water, gas and electricity. These adverse effects are inevitable with the urbanization of lands.

ALTERNATIVES TO THE PROPOSED ACTION

The possible alternatives to establishment of the proposed Kailua-Keauhou Elementary School are:

1. Expand the facilities at Kealakehe Elementary School to accommodate the projected student enrollment from the Kailua-Keauhou vicinity and expand the bus service.

2. Utilize existing schools on year-round basis to reduce facility requirements.

3. Expand the facilities at Holualoa Elementary School to accommodate the projected student enrollment from the Kailua-Keauhou vicinity and expand the bus service.

4. Expand the facilities at Konawaena Elementary School in the Kona District to accommodate the projected enrollment and expand the bus service.

5. Construct a new school at the old Kailua School

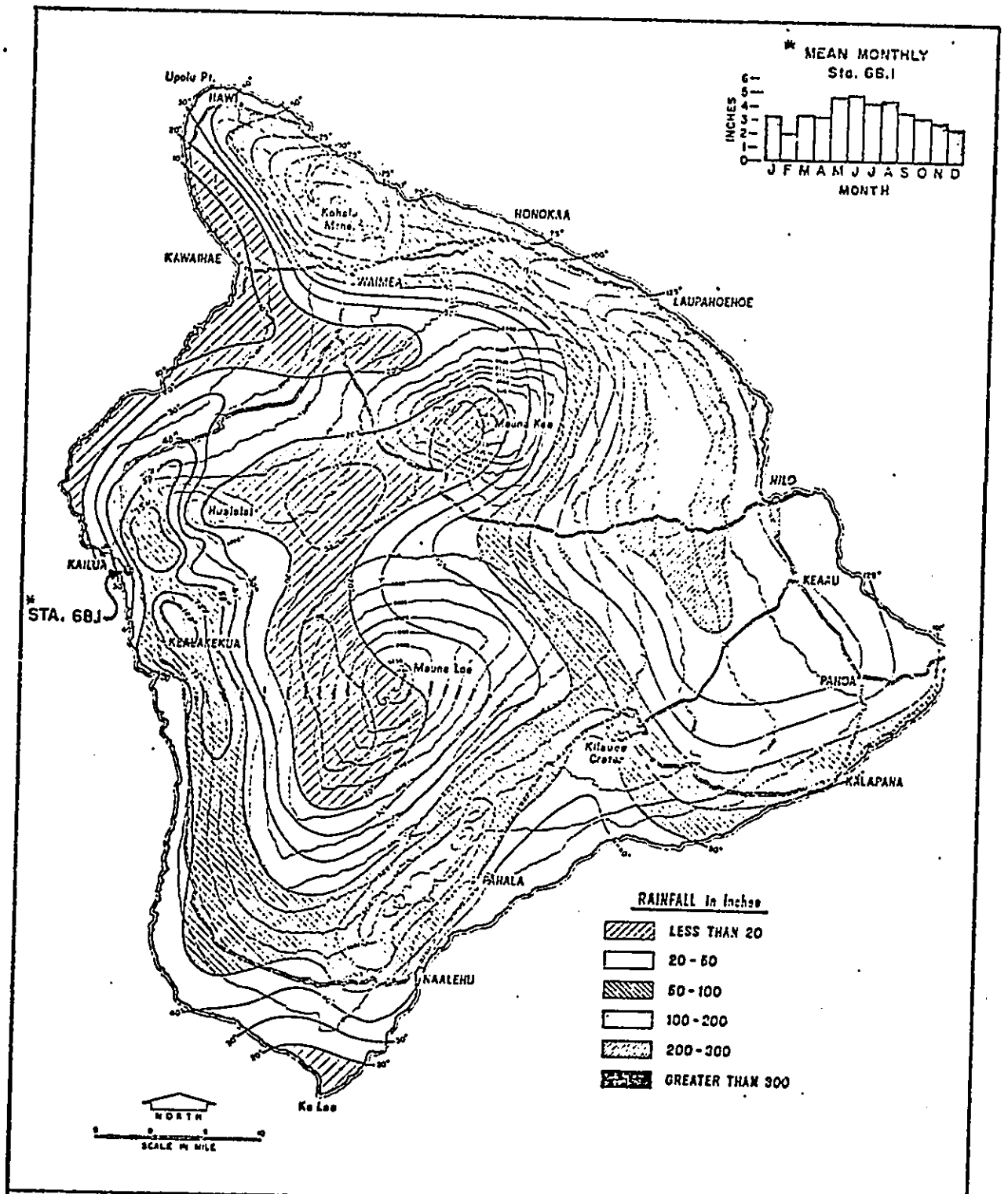


EXHIBIT F	MEAN ANNUAL RAINFALL
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH

site on Hualalai Road between Alii Drive and Kuakini Highway.

The above alternatives were considered but rejected in favor of the new school for the following reasons:

1. The existing elementary facilities at Kealakehe School could be expanded to accommodate the projected 630 additional students from Kailua-Keauhou. However:

   a. The combined elementary school enrollment of 1,400 students will exceed the DOE's desirable maximum of 1,000 students for elementary schools.

   b. New facilities will be required to accommodate the additional students.

   c. The 630 students will have to be bussed.

2. The possibility of year-round use of school facilities has been considered. However, this alternative is not desirable at this time because a four-quarter, year-round school schedule was tried at Konawaena Elementary and High Schools during schools years 1969-71. The results of the two-year pilot project showed that the year-round school, while philosophically sound, required the attendance of a minimum number of students, which in Kona did not materialize. For example, at Konawaena High and Intermediate, only 88 out of 1,100 students chose the December start date the first year and this number declined to 29 the second year. Based on the above, the Board of Education accepted the Superintendent's recommendation that the Kona Four-Quarter Schedule be discontinued and all Kona schools be placed on the September-June schedule effective 1971-72 school year.

3. The existing Holualoa School facilities could be expanded to accommodate the projected enrollment of 700 students. The disadvantages are:

   a. The 630 students projected for the Kailua-Keauhou area would have to be bussed.

   b. The need to transport the 630 students from Kailua-Keauhou along the narrow and winding Holualoa Road and Mamalahoa Highway for an additional 5 to 10 miles would create safety concerns.

c. The facilities at Holualoa School are old and will require complete replacement.

d. The DOE is observing a status quo situation on the future of Holualoa School while monitoring the enrollment trends in the Kona District.

4. The problems with expanding Konawaena Elementary School are:

a. The addition of 630 students from Kailua-Keauhou to the 600+ students at Konawaena will exceed the desirable maximum of 1,000 students for elementary schools.

b. More facilities will be required to accommodate the 630 additional students projected.

c. Land is presently being acquired for the elementary play area. Additional land will be needed.

d. The 630 students will have to be bussed about 10 miles.

5. Reconstructing the old Kailua School is undesirable for the following reasons:

a. The school site is within the Keopu Flood Basin and also within the tsunami inundation zone.

b. The 2-acre site size is too small to meet the school's requirements and expansion of the site would require expensive acquisition of adjacent developed properties.

RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The possible short-term effect of the school development on man's environment is expected to be minimal in comparison to the long-term benefits to be gained. The State is committed to the goal of educating its people. Accordingly, the proposed school is required to implement that goal.

MITIGATION MEASURES PROPOSED TO MINIMIZE IMPACT

The transformation of the selected school site from its present undeveloped state to a school campus will have some impact on the environment. The temporary effects created during the construction phases of the project will be minimized by enforcing the applicable DAGS pollution control

measures. These mitigation measures are specified by Section 1G - Environmental Protection, and Section 2I - Grass Planting which are contained in Appendix I of this EIS. The school development will also comply with all Federal, State, and County regulations pertaining to land use, construction and environmental controls to ensure protection of the public health, safety and welfare. Acquisition of the selected site will be in accordance with State laws which will provide fair compensation and relocation assistance to mitigate financial hardship to the landowner. Additional engineering studies will be conducted on the selected site, including a walk-through archaeological survey to ensure the preservation of any valuable historical site, before the site is acquired.

IRREVERSIBLE COMMITMENTS OF RESOURCES

The labor required for construction of the school and the materials which cannot be economically recycled will be irreversible commitments of resources. Also, the labor, material, and utilities required for operation and maintenance of the school are irreversible. The land required by the school could be used for other purposes. However, it would probably be committed to other public uses if the school is discontinued in the future.

CONSULTATION WITH OTHER AGENCIES

The following agencies and parties were consulted in the preparation of this document. Their comments and DAGS responses are included in Appendix II of this EIS.

A. Federal Agencies

Soil Conservation Service
U.S. Department of Agriculture
Mr. Francis Lum

Alexander Young Bldg.
Room 440
Honolulu, Hawaii 96813

Corps of Engineers
Pacific Ocean Division
U.S. Army

Fort Shafter
Bldg. 230
APO San Francisco 96558

B. State Agencies

Department of Agriculture
John Farias, Jr.

Department of Education
Charles Clark

Department of Education, Hawaii District
William Waters

Department of Health
Shinji Soneda

Department of Land and Natural Resources
Christopher Cobb

Department of Land and Natural Resources
Historic Preservation Officer
Jane Silverman

Department of Planning and Economic Development
Hideto Kono

Department of Transportation
E. Alvey Wright

Office of Environmental Quality Control
Dr. Richard Marland

U.H. Environmental Center
Dr. Doak C. Cox

Department of Social Services and Housing
Andrew Chang

C. County Agencies

Planning Department Raymond Suefuji	25 Aupuni Street Hilo, Hawaii 96720
Department of Public Works Edward Harada	25 Aupuni Street Hilo, Hawaii 96720
Department of Parks and Recreation Milton Hakoda	25 Aupuni Street Hilo, Hawaii 96720
Department of Research and Development Clarence Garcia	25 Aupuni Street Hilo, Hawaii 96720
Department of Water Supply Akira Fujimoto	P. O. Box 1820 Hilo, Hawaii 96720

D. Public Utilities

Hawaiian Telephone Co.	115 Kalakaua Street Hilo, Hawaii 96720
Hawaii Electric Co.	P. O. Box 1027 Hilo, Hawaii 96720
Gasco Inc., Hawaii Division	945 Kalanianaole Avenue Hilo, Hawaii 96720

E. Media

Hawaii Tribune Herald	P. O. Box 767 Hilo, Hawaii 96720

West Hawaii Today	P. O. Box D Kealakekua, Hawaii 96750

F. Kona Civic Organizations

Kealakehe School P.T.A	P. O. Box 220 Kailua-Kona, Hawaii 96740
Holualoa School P.T.A.	P. O. Box 345 Holualoa, Hawaii 96725
Konawaena School P.T.A.	P. O. Box 698 Kealakekua, Hawaii 96750
Kona Chamber of Commerce Leo Fleming	P. O. Box 635 Kailua-Kona, Hawaii 96740
Kona Traffic Safety Committee c/o Suzy Ohira	P. O. Box 1360 Kailua-Kona, Hawaii 96740
Kona Conservation Group Alan Tyler	RR#1 Box 125 Captain Cook, Hawaii 96704
Lloyd Hara, Chairman Hawaii District S.A.C.	26 Santos Lane Hilo, Hawaii 96720
Kona Civic Club c/o Rufus Spaulding	Kailua-Kona, Hawaii 96740
West Hawaii Committee Jim Potter	P. O. Box 1761 Kailua-Kona, Hawaii 96740
Kona Soil and Water Conservation Bill Parish	Kainaliu-Kona, Hawaii 96750
Kona Outdoor Circle Pearl Rein	P. O. Box 1148 Kailua-Kona, Hawaii 96740

G. Landowners

Kamehameha Development Corp. Mr. Guido Giacometti	700 Bishop Street Suite 601 Honolulu, Hawaii 96813
Kobayashi Development Co. Mr. Kazuo Omiya	1150 South King Street Room 901 Honolulu, Hawaii 96814
Dillingham Investment Corp. Mr. Donn W. Carlsmith	Captain Cook, Hawaii 96704

Kona Industries, Inc. Mr. Bob Bonde	P. O. Box 851 Kailua-Kona, Hawaii 96740
Chiaki Matsuo	P. O. Box S Papaaloa, Hawaii 96780
John B. Kaelemakule 3/4 Winona K. K. Akuna 1/4 c/o John K. Collins	1458 Kamenaka Place Honolulu, Hawaii 96816

APPENDIX I

Section 1G - Environmental Protection

Section 2I - Grass Planting

NOTES TO ARCHITECT

Add to, delete from, or modify provisions to suit your project. However, notify the Public Works Engineer in writing at or before the Pre-Final Submittal of any proposed changes to the requirements herein.

SECTION 1G - ENVIRONMENTAL PROTECTION

The Contractor shall comply with the following requirements for pollution control in performing all construction activities:

1. RUBBISH DISPOSAL

   A. No burning of debris and/or waste materials shall be permitted on the project site.

   B. No burying of debris and/or waste material except for materials which are specifically indicated elsewhere in these specifications as suitable for backfill shall be permitted on the project site.

   C. All unusable debris and waste materials shall be hauled away to an appropriate off-site dump area. During loading operations, debris and waste materials shall be watered down to allay dust.

   D. No dry sweeping shall be permitted in cleaning rubbish and fines which can become airborne from floors or other paved areas. Vacuuming, wet mopping or wet or damp sweeping is permissible.

   E. Enclosed chutes and/or containers shall be used for conveying debris from above to ground floor level.

   F. Cleanup shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of cleanup shall coincide with rubbish producing events.

2. DUST

   A. Dust shall be kept within acceptable levels at all times including non-working hours, weekends and holidays in conformance with Chapter 43 - Air Pollution of the State Department of Health Public Health Regulations, latest edition.

   B. The method of dust control and all costs incurred therefor shall be the responsibility of the Contractor.

   C. The Contractor shall be responsible for all damage claims in accordance with Section 7.7 - "Responsibility for Damage Claims" of the General Requirements and Covenants.

3. NOISE

   A. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels.

B. No blasting and use of explosives will be permitted without prior approval of the Engineer.

C. Pile driving operations shall be confined to the period between 8:00 a.m. and 5:30 p.m., Monday through Friday. Pile driving will not be permitted on weekends and legal State and Federal holidays.

NOTES TO ARCHITECT

In the event the Contractor's operations require the State's inspectional and engineering personnel to work overtime, the Contractor shall reimburse the State for the cost of such services in accordance with Section 8.3 of the General Requirements and Covenants.

D. Starting up of non-highway vehicular equipment shall not be done prior to 6:45 a.m. without prior approval of the Engineer.

4. EROSION

During interim grading operations the grade shall be maintained so as to preclude any damages to adjoining property from water and eroding soil. Temporary berms, cut-off ditches, and other provisions which may be required because of the Contractor's method of operation shall be installed at no cost to the State. Drainage outlets and silting basins shall be constructed and maintained as shown on the plans to minimize erosion and pollution of waterways during construction.

5. OTHERS

A. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the Contractor shall prevent any material from being carried onto the pavement. Waste water shall not be discharged into existing streams, waterways, or drainage systems such as gutters and catch basins unless treated to comply with Department of Health water pollution regulations.

B. Trucks hauling debris shall be covered as required by PUC Regulation. Trucks hauling fine materials shall be covered.

C. No dumping of waste concrete will be permitted at the job site unless otherwise permitted in the Special Provisions.

D. Except for rinsing of the hopper and delivery chute, and for wheel washing where required, concrete trucks shall not be cleaned on the job site.

E. Except in an emergency, such as a mechanical breakdown, all vehicle fueling and maintenance shall be done in a designated area. A temporary berm shall be constructed around the area when runoff can cause problems.

F. When spray painting is allowed under Section 9A - Painting, such spray painting shall be done by the 'airless spray' process. Other types of spray painting will not be allowed.

6. SUSPENSION OF WORK

Violation of any of the above requirements or any other pollution control requirements which may be specified in the Technical

Job No. (Insert No.)
Page 1G2
Rev. 9/76

Specifications herein shall be cause for suspension of the work creating such violation. No additional compensation shall be due the Contractor for remedial measures to correct the offense. Also, no extension of time will be granted for delays caused by such suspensions.

If no corrective action is taken by the Contractor within 72 hours after a suspension is ordered by the Engineer, the State reserves the right to take whatever action is necessary to correct the situation and to deduct all costs incurred by the State in taking such action from monies due the Contractor.

The Engineer may also suspend any operations which he feels are creating pollution problems although they may not be in violation of the above mentioned requirements. In this instance, the work shall be done by force account as described in Subsection 4.2(e) "FORCE ACCOUNT WORK" of the General Requirements and Covenants and paid for in accordance with Subsection 9.4(b) "FORCE ACCOUNT WORK" therein. The count of elapsed working days to be charged against the contract in this situation shall be computed in accordance with Subsection 8.8(d) "CONTRACT TIME" of the General Requirements and Covenants.

DIVISION 2 - SITE WORK

SECTION 2 I - GRASS PLANTING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. WORK SPECIFIED IN THIS SECTION:

The work to be performed under this section shall include furnishing all labor, materials, equipment and tools for grass planting as specified herein. Grass shall be planted in areas indicated on the drawings and as listed below:

a. All existing grassed areas that are damaged by construction operations;

b. Areas that are dug up for utility trenches;

c. Areas from which existing structures are to be removed;

d. Areas within "Contract Zone Limits" that are graded and covered with top soil except areas designated for other plants; and

e. All other areas within "Contract Zone Limits" that are indicated on the plans to be graded, whether topsoiled or not, such as slopes of banks, etc.

3. WORK SPECIFIED IN OTHER SECTIONS:

Top soil for general finish grading and its installation are specified under EARTHWORK SECTION. However, screened top soil for repair work as specified herein shall be furnished and installed under this section.

4. MATERIALS:

a. Grass shall be that locally known as fine "Manienie" or common Bermuda grass (Cynodon Dactylon). At the option of the Contractor, grass planting may be by seeds (plain seeding or by hydromulching) or by sprigs.

(1) Grass seeds shall be fresh, hulled, and meet the following requirements:

NOTES TO ARCHITECT

Where the planting of trees and shrubs and/or the transplanting of trees are included in the project, this specification shall be modified to include the work and entitled LANDSCAPING instead of GRASS PLANTING.

For clarity, indicate on site plan all areas to be grassed so that there is no doubt as to the extent of new grassing. If necessary, draw a separate grassing plan. Do not use the term "Lawn Area".

Also, if project is adjacent to a road, indicate any unimproved parkway (area between curb and sidewalk) as a separate contract zone for grassing only.

Unless otherwise instructed by the State, pave all parking lot medial strips.

Make sure that top soil for general finish grading (as opposed to the screened top soil for repair work specified herein) is specified in the EARTHWORK SECTION. The location and extent of topsoil shall be clearly defined. In general, topsoil is required over all graded areas.

Specify "Manienie" grass, even on banks. Do not specify Widelia-Biflora and Lippia grass. (For other than school projects, check with appropriate Project Coordinators.)

For Hawaii District schools, specify only Australian Carpet Grass. Due to heavy rainfall and poor topsoil in most locations, manienie grass does not hold up.

Pure seed	95.0% minimum
Crop seed	1.0% maximum
Weed	0.5% maximum
Inert Material	5.0% maximum
Germination	85.0% minimum

Grass seeds shall be delivered to the site in unopened, sealed containers, labeled with brand name and per cent purity. Labeling shall indicate that the seeds passed a certified germination test no more than 12 months prior to use.

(2) Grass sprigs shall be healthy living runners and stolons. After they are dug, they shall be covered and kept moist until planted.

b. Pertilizer shall be pelleted and shall consist of the following percentages by weight of active ingredients:

(1) For First Application:

Nitrogen	8%		10%
Phosphate	24%	OR	20%
Potash	24%		20%

(2) For Second Application:

Nitrogen	18%		16%
Phosphate	18%	OR	16%
Potash	5%		16%

c. Mulch Materials

(1) Mulch shall be specially processed fiber containing no growth or germination inhibiting factors. It shall be such that after addition and agitation in the hydraulic equipment with seed, fertilizer, water and other additives not detrimental to plant growth, the fibers will form a homogeneous slurry. When hydraulically sprayed on the soil, the fibers shall form a blotter-like ground cover which readily absorbs water and allows infiltration to the underlying soil.

(2) Stabilizing and water retaining agent for hydro-mulching option only shall be "Verdyol Super", "Ecology Control M-Binder" or approved equal. Rate of application

NOTES TO ARCHITECT

For areas which will be in shade most of the time, such as under building overhangs, in building "nooks", or under large spreading trees with dense foliage, use the following:

In low, hot locales - Buffalo grass (Stenotaphrum secundatum).
In high, moist locales - Centipede grass.

Zoysia, if used, shall be permitted only in parking lot medial strips. It shall not be specified for large areas because it is slow growing and expensive.

Modify entire specs as necessary when above grass types are used.

NOTES TO ARCHITECT

of "Verdyol Super" shall be 50 lbs./acre and that for "Ecology Control M-Binder" shall be 60 lbs./acre.

d. Screened topsoil for repair work shall be a fertile, friable soil of loamy character, and shall contain organic matter. It shall be obtained from well-drained arable land; be free from weeds, stone and debris; and shall pass a maximum 1/4" screen. Topsoil shall be capable of sustaining healthy plant life. See Paragraph 5d(5) for application.

Since it is difficult and/or very expensive to obtain good topsoil in the Hilo and Kona areas, contact the appropriate Project Coodinator for guidance. This also applies to topsoil for finish grading which is specified in the Earthwork Section.

e. Water shall be potable.

5. INSTALLATION AND WORKMANSHIP:

a. Preparation of Planting Bed:

(1) Raking: Before grass planting is started, the entire area shall be raked to an even surface and all rocks and debris removed. Weeds and other obnoxious vegetation shall be removed by manual or chemical methods. Finished grades which have been established shall be maintained and shall conform to that shown on the drawings with slopes in the proper directions.

(2) Tilling: Where required because the soil is hardpacked, existing and/or raked surfaces at finished grades shall be tilled to a depth of at least 3 inches by plowing, disking, harrowing, or other similar methods. All rocks and all debris such as stumps, roots, wire, grade stakes and other rubbish that are turned up by tilling shall be removed. Tilling shall be omitted on slopes where watering is likely to wash the top soil away.

(3) Leveling: Any undulations or irregularities in the surface resulting from tilling or other operations shall be leveled out before planting operations are begun.

b. Planting:

The Contractor shall notify the Engineer one day before planting of grass.

(1) Cotion by Grass Seeding: If grass seeds are used, the following procedure shall be used (NOTE: Contractor should exercise caution in seeding slopes where seeds may be washed away):

Job No. (INSERT NO.)
Page 213
Rev. 6/75

NOTES TO ARCHITECT

(a) The grass seeds shall be broadcast uniformly by hand or by sowing equipment at the rate of 100 pounds per acre. Half the seeds shall be sown with the sower moving in one direction and the remainder shall be sown at right angles to the first direction.

Specify sowing rate of 50 pounds per acre for Buffalo grass or 25 pounds per acre for Centipede grass.

(b) The surface shall then be raked to a smooth even plane while the seeds are simultaneously worked into the soil to a depth of about 1/2 inch.

(c) The ground shall then be watered.

(2) Option by Grass Sprigging:

(a) Furrows shall be placed perpendicular to drainage lines and parallel to contours on slopes and shall be spaced no more than 9" apart.

(b) Fresh sprigs shall be planted in each furrow a maximum of 6" apart and covered with soil to a minimum depth of 2 inches.

(c) The surface shall then be smoothed and compacted by means of a culti-packer, roller or other similar equipment weighing 60 to 90 pounds per lineal foot of roller.

(d) The ground shall be watered immediately after rolling.

(3) Option by Hydro-Mulching of Grass Seed:

This work shall consist of furnishing and applying hulled bermuda seed, fertilizer, mulch and stabilizing and water retaining agent by hydro-mulching.

(a) The seeds shall be applied at the rate of 100 pounds per acre minimum. Mulch shall be applied at a rate of 1200 pounds per acre minimum (25 lbs. per 900 sq. ft.). In every application, complete and uniform coverage of the soil shall be attained.

(b) First application of fertilizer shall be included with mulch and seed.

NOTES TO ARCHITECT

(c) The hydro-mulch equipment shall be capable of mixing all the necessary ingredients to a uniform mixture and to apply the slurry to provide uniform coverage. Seed, fertilizer, mulch mix and stabilizing water retaining agent shall be applied in one operation by hydraulic equipment made specifically for this use. The equipment shall have a built-in agitation system with an operating capacity sufficient to keep the mix in uniform distribution until pumped from the tank. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with hydraulic discharge spray nozzles which provide a uniform distribution of the slurry.

(d) Areas inaccessible to hydro-mulching application shall be seeded or hand sprigged and fertilized by approved hand methods.

(e) Water shall be applied immediately following mulching.

c. Application of Fertilizer:

The Contractor shall notify the Engineer one day before application of fertilizer.

(1) Fertilizer shall be distributed uniformly over the planted area.

(2) The first application of fertilizer shall be applied at the rate of 500 pounds per acre about two weeks after grassing and shall be followed by watering. (First application of fertilizer if using hydro-mulching option shall be mixed with the seeded mulch.)

(3) The second application of fertilizer shall be applied at the rate of 200 pounds per acre about one week before the end of the maintenance period and shall be followed by watering.

d. Maintenance:

(1) General: The Contractor shall be responsible for the proper care of the grassed areas. Maintenance shall include watering, weeding, mowing, repairing, regrassing and protection, and shall be required until the entire project is accepted, but in any event for a period not less than _____ days after planting of grass.

Specify maintenance period: 60 days for 1st increment or large areas: 45 days for 2nd increment or smaller areas.

Job No. (INSERT NO.)
Page 215
Rev. 6/75

(2) Watering: After planting of seeds or grass sprigs or mulching the ground shall be watered as deemed necessary by the Contractor to establish a healthy growth. Watering shall be done in a manner that will prevent erosion due to the application of excessive quantities of water, and the watering equipment shall be of a type that will prevent damage to the finished surface.

(3) Weeding: Weeds shall be uprooted and removed completely and in no case shall they be allowed to grow and propagate more seeds. Large holes caused by weeding shall be filled with screened top soil and raked level.

(4) Mowing: Grass shall be mowed to a height of 1-1/2" whenever the height of grass becomes 3" except as noted for final mowing.

(5) Repairing and Regrassing: When any portion of the surface becomes gullied or otherwise damaged and grass has failed to grow, such areas shall be repaired with screened top soil and replanted with grass. Any area of one foot square or more in which grass has failed to grow after 30 days of maintenance shall be regrassed.

(6) Protection: The grassed areas shall be protected against traffic so that the grass establishes a healthy growth. Grassed areas damaged by traffic shall be replanted.

6. ACCEPTANCE OF GRASSING:

At the time of acceptance, the grass shall have been well established and shall be given a final weeding and a final mowing to a height of 1".

At the end of the maintenance period, should there appear areas where grass has failed to grow, such areas shall be replanted with grass, refertilized and maintained beyond the maintenance period until a healthy growth is established.

Job No. (INSERT NO.)
Page 216
Rev. ~~6/75~~
2/76

APPENDIX II

Review Comments and Responses

DRAFT SITE SELECTION REPORT AND EIS
INDEX OF CORRESPONDENCE

Agency	Agency Comment	DAGS Response
Federal		
Corps of Engineers Pacific Ocean Division U.S. Army	2/11/77	Not Required
State		
Department of Accounting & General Services Hawaii District Office Mr. Kaoru Higaki	12/16/76	Not Required
Department of Agriculture Mr. John Farias, Jr.	12/14/76	Not Required
Department of Education Mr. Charles Clark	1/20/77	4/12/77
Department of Health Dr. James Kumagai	1/19/77	3/15/77
Department of Land & Natural Resources Mr. Christopher Cobb	12/21/76	2/4/77
State Historic Preservation Officer Miss Jane Silverman	12/29/76	2/3/77
Office of Environmental Quality Control Dr. Richard Marland	1/4/77	3/29/77
Department of Planning & Economic Development Mr. Hideto Kono	12/29/76	2/4/77
Department of Social Services & Housing Mr. Andrew Chang	12/9/76	Not Required
Department of Transportation Admiral E. Alvey Wright	1/7/77	3/28/77
U.H. Environmental Center Dr. Doak C. Cox	1/17/77	Not Required

Agency	Agency Comment	DAGS Response
Hawaii County		
Department of Parks & Recreation Mr. Milton Hakoda	12/30/76	3/28/77
Planning Department Mr. Raymond Suefuji	12/14/76	2/3/77
Department of Public Works Mr. Edward Harada	12/10/76	2/3/77
Department of Water Supply Mr. Akira Fujimoto	12/7/76	Not Required
Utilities		
Hawaiian Telephone Co.	12/1/76	2/3/77
Landowners		
Kamehameha Development Corp.	3/22/77	See Bishop Estate
B. P. Bishop Estate	4/13/77	8/23/77
Mr. John K. Collins	12/30/76	2/3/77
Kobayashi Development & Construction, Inc.	2/18/77	3/4/77
"	2/28/77	4/5/77
"	3/11/77	4/12/77
Mr. Chiaki Matsuo	12/13/76	2/3/77

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)2240.6

NOV.29 1976

To Whom It May Concern:

Subject: Draft Site Selection Report and
Environmental Impact Statement
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Attached is a copy of the subject report for your review and comments. The document provides a comprehensive evaluation of alternative sites for the proposed Kailua-Keauhou Elementary School and discusses the potential environmental impacts of the project. Your written comments are requested by December 31, 1976 and should be sent to:

Department of Accounting and General Services
1151 Punchbowl Street
P. O. Box 119
Honolulu, Hawaii 96810

We would appreciate those comments especially within your area of responsibility, expertise and/or concern. All comments received will be considered in the final evaluation and recommendation of the proposed school site and the environmental impact statement.

If you have no comments to offer relative to the project, we would appreciate your response to that effect. Should you have specific questions or need additional clarification on the report, please direct your inquiries to the project coordinator, Mr. Harold Sonomura of my Public Works Division staff at 548-5703.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

HS:iy
Attachment

DEPARTMENT OF THE ARMY
HONOLULU DISTRICT, CORPS OF ENGINEERS
BLDG. 230, FT. SHAFTER
APO SAN FRANCISCO 96558

PODED-P

11 February 1977

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Mr. Hideo Murakami, State Comptroller
Department of Accounting and General Services
1151 Punchbowl Street
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Murakami:

We have reviewed the Kailua-Keauhou Elementary School Site Selection and Environmental Impact Statement draft and have no specific comments to make at this time.

We appreciate the opportunity to review this document.

Sincerely yours,

KISUK CHEUNG
Chief, Engineering Division

BICENTENNIAL 1776-1976 AMERICAN REVOLUTION

STATE OF HAWAII
DEPARTMENT OF
ACCOUNTING AND GENERAL SERVICES

HAWAII DISTRICT OFFICE
P.O. BOX 1561
HILO, HAWAII 96720

DATE December 16, 19

TO: Mr. Teuane Tominaga, Planning Branch
ATTN: Mr. Harold Sonomura

FROM: Kaoru Higaki

SUBJECT: Draft Site Selection and E.I.S.
Kailua-Keauhou Elementary School

Thank you for allowing us to review and comment on the Draft Site Selection and E.I.S. for Kailua-Keauhou Elementary School.

Upon reviewing the entire report, we have no comments to submit at this time.

DISTRICT ENGINEER, HAWAII

:tty

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GEORGE R. ARIYOSHI
GOVERNOR

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JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE

YUKIO KITAGAWA
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

December 14, 1976

MEMORANDUM

To: Honorable Hideo Murakami
State Comptroller, DAGS

Subject: Draft Site Selection Report and
Environmental Impact Statement
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii
TMK: 7-5-19 & 20, 7-6-13 & 7-8-10

The Department of Agriculture has reviewed the subject draft report. All alternative sites except one, site E, are in urban designated areas. As mentioned in the report, site E would require a zoning amendment to the State Land Use District Map.

Thank you for the opportunity to comment.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

GEORGE R. ARIYOSHI
GOVERNOR

CHARLES G. CLARK
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

January 20, 1977

MEMO TO: Honorable Hideo Murakami, Comptroller
Department of Accounting and General Services

F R O M: Charles G. Clark, Superintendent
Department of Education

SUBJECT: Kailua-Keauhou (Kona) Elementary School
Site Selection and EIS

We have reviewed the draft site selection report. The following comments were received from Hawaii School District:

1. The Hillcrest subdivision should be included in the service area of the proposed school (Figure 4). The fragmentation and dislocation of families within a contiguous subdivision is not recommended.

2. Substantial research and data have been provided for each of the alternative sites such as that relating to slope, road access, vegetation, rainfall, etc.; however, the important element of the climate and specifically the prevailing air temperature at the sites is not provided. One of the prime problems encountered when we had the Kailua, Kona Elementary School was the extremely warm climate. It is well known that the area nearer to the ocean is dry and very warm (Sites A, B, D and E), and would have definite disadvantages. We would have problems and high cost maintaining the landscape and classrooms would require some form of artificial ventilation. The altitude and physical conditions of Sites A, B, D, and E areas are not too far different from that at Kihei, Maui, where there have been serious concerns raised. We do not feel it would be prudent to consider the lower sites even with artificial ventilation as the operating cost factor would be substantially high.

3. The design enrollment should be corrected from 550 to 630.

4. The optimum acreage should be changed to 7 acres -- usable to coincide with current DOE standards.

Recommendation

We have considered all aspects of the selection criteria and would recommend Site C. While there are some negative factors for this site, we do not feel they are unsurmountable.

The evaluation criteria lists Site "C" with several items as being "poor." Generally, those items listed as "poor" for Site "C" are also applied to the other seven sites with the exception of accessibility - safety and community effects - location.

The accessibility criteria is not a major problem as it can be engineered properly. Its location is not that much a negative form as Site "C" will be along an existing highway and there are good probabilities of adjacent lands being developed which would be within easy access without bussing.

In view of the strong preference of Hawaii District for Site C for climatic reasons, we request that the final report provide statistical data on the temperature and humidity conditions at the various sites.

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)1378.7

APR 12 1977

Honorable Charles Clark
Superintendent
Department of Education
State of Hawaii
Honolulu, Hawaii

Dear Mr. Clark:

Subject: Draft Site Selection and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

In answer to your January 20, 1977 comments on the subject report, the following responses are offered:

1. Service Area

The service area for the school will be amended as requested to include the entire Hillcrest Subdivision.

2. Temperature and Humidity

The effect of the prevailing temperatures at the alternative sites were not evaluated because the DOE has not established a standard for temperature and humidity control in schools which is necessary for an evaluation of the climatic advantage or disadvantage of each alternative site. However, the attached climatological data will be included in the EIS. The prevailing temperature at the alternative sites are approximately equal based on the attached climatological data. Please note that the estimated maximum temperature difference between Site B (50 ft. elevation) and Site G (300 ft. elevation) is 1° F.

3. Design Enrollment

The design enrollment will be increased from 550 to 630 based on your revised projections.

4. Site Size

The required acreage for the school will be reduced from 10 to 7 usable acres to reflect the recent change in the DOE standards.

5. Accessibility

Based upon the review comments received from the State Department of Transportation, the proposed access to Site C will be revised as shown on the attached map. The revised access from the proposed Alii Highway and the Konawai Subdivision roadways will minimize traffic hazards from Kuakini Highway.

6. Recommendation

Your recommendation of Site C will be considered when the final school site is recommended to the Governor. See Item 2. above in regard to your climatic reasons for Site C.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

Attachment

Climate

Although the island of Hawaii lies within the tropics, its climate is semi-tropical and varies locally with elevation and orientation to the tradewinds. In general, the climate is characterized by two seasons a year, by mild and fairly uniform temperatures except at higher elevations, by prevailing tradewinds, by marked differences geographically in rainfall patterns, and by typically humid and cloudy conditions except in leeward coastal areas and at higher elevations.

Temperature

Temperature depends almost entirely on elevation, although affected somewhat by slope, wind exposure, and cloud cover. Thus, regular sequences are characteristic of monthly temperatures on the island of Hawaii. Mean temperature on the island of Hawaii is graphically depicted in Exhibit D. The spaces between isotherms (lines of equal temperature) from the coast to mountain peaks indicate the decrease of mean temperature with elevation.

Records show that the mean and daily temperatures decrease at an approximate rate of 1° F for each 300 feet increase in elevation, the rate being somewhat greater at the lower elevations. This uniform rate of temperature change is usually halted or reversed between the 5,000 or 7,000-foot elevation. This "temperature inversion" is generally associated with tradewind air circulation, warm air rising at the equator, flowing toward the North Pole above the inversion level, and returning below the inversion level from the northeast because of the earth's rotation on its axis. The ceiling of tradewind clouds is generally at the inversion level.

Because of the mild, equable temperatures of the ocean waters surrounding the island, temperatures in the air moving across the ocean and over the island are also mild and equable. The range of mean monthly temperature from summer to winter is slight and the mean annual temperature variations are also slight. Temperatures above 90° F are very unusual, except in the dry leeward area of South Kohala and temperatures less than 55° F are uncommon except at elevations above 2,500 feet. The following table shows the monthly mean maximum temperatures at selected stations in the Kona area:

TEMPERATURE AT SELECTED STATIONS

Station	Elevation	Monthly Mean Maximum Temperature											
		J	F	M	A	M	J	J	A	S	O	N	D
Kona Airport	15	80.8	80.6	81.0	81.7	82.1	82.6	83.6	84.6	84.8	84.4	83.1	81.4
Napoopoo	400	79.6	79.9	80.8	81.7	81.9	82.6	83.6	84.4	84.3	83.5	82.0	80.4
Holualoa	1450	75.6	75.4	75.2	75.4	76.1	76.3	77.9	78.8	78.4	79.0	78.5	76.9
Kainaliu	1500	77.2	77.5	77.1	77.1	77.1	77.4	79.3	80.1	80.4	80.4	79.2	77.5

SOURCE: An Inventory of Basic Water Resources Data, Island of Hawaii, Report R34, State of Hawaii, Department of Land and Natural Resources, February 1970.

Based on the above, it is anticipated that the maximum temperatures at the alternative school sites which are located from 50 to 300 feet elevation would be somewhere between the temperatures recorded at Kona Airport and Napoopoo.

Humidity

Humidity measurements are expressed in relative terms by comparing the volume of moisture in the air to the volume in totally saturated air. Under prevailing tradewind conditions, from 50 to 70 percent of the time, moisture distribution in the air surrounding the island mass is greatly influenced by the characteristic temperature inversion. Relative humidity below the inversion is roughly 70 to 80 percent in the drier leeward areas. Above the inversion, relative humidity is generally less than 40 percent, often declining to 10 or even 5 percent.

Wind

Northeasterly tradewinds prevail most of the year on the island of Hawaii, as elsewhere in the State. The tradewinds are forced around Mauna Loa and Mauna Kea by the high mountain masses and the characteristic inversion level and lose velocity laterally along the slopes with distance from the northeasterly impact area. Although these winds approach the island at a fairly constant speed, the uniform flow is distorted as the tradewinds traverse the island and combine with local winds on the mountain slopes and lowlands to form complex wind patterns. The wind patterns for the Kona District is graphically indicated on the windrose for the old Kailua-Kona Airport shown on Exhibit E.

During the cooler winter months the trades are usually replaced by other general winds, primarily the southerlies. Occasional tropical storms also generate winds from various directions. The wind pattern is a key factor in the determination of rainfall and affects humidity, evaporation, and temperature. Average wind speeds over the ocean surrounding the island are highest during the summer tradewind period, exceeding 12 miles per hour 50 percent of the time. However, occasional high winds with speeds exceeding the summer trades occur during the winter months.

Rainfall

The moisture-laden trades are cooled as they rise up the mountain slopes of Mauna Loa and Mauna Kea and lose part of their moisture as rain. The tradewinds which must go around Mauna Loa and Mauna Kea do not reach most of the Kona District and therefore cause only minimal orographic rainfall. However, the difference between land and water temperatures along the Kona coast on warm days, particularly in summer, generates moderate seabreeze circulation which results in

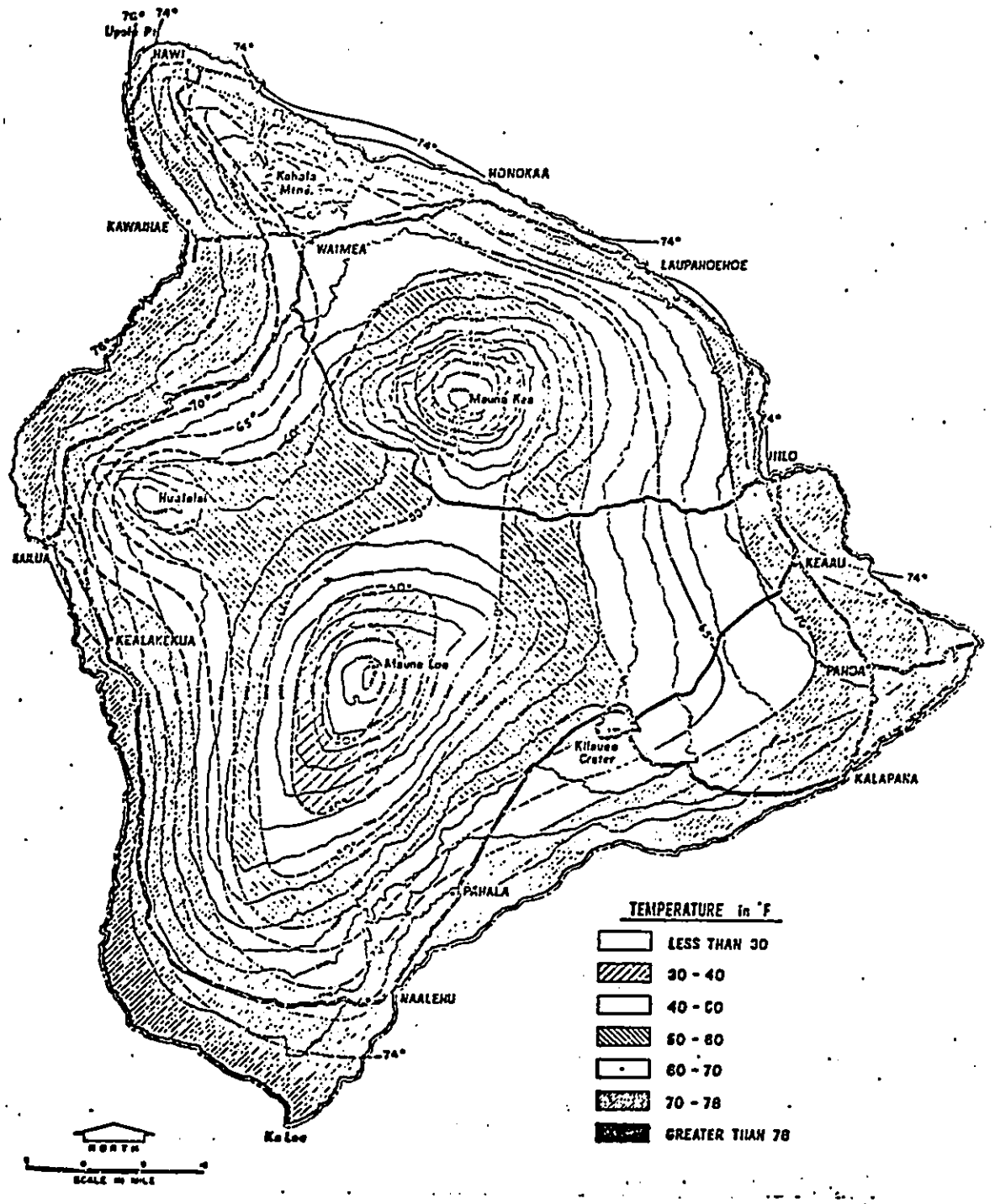
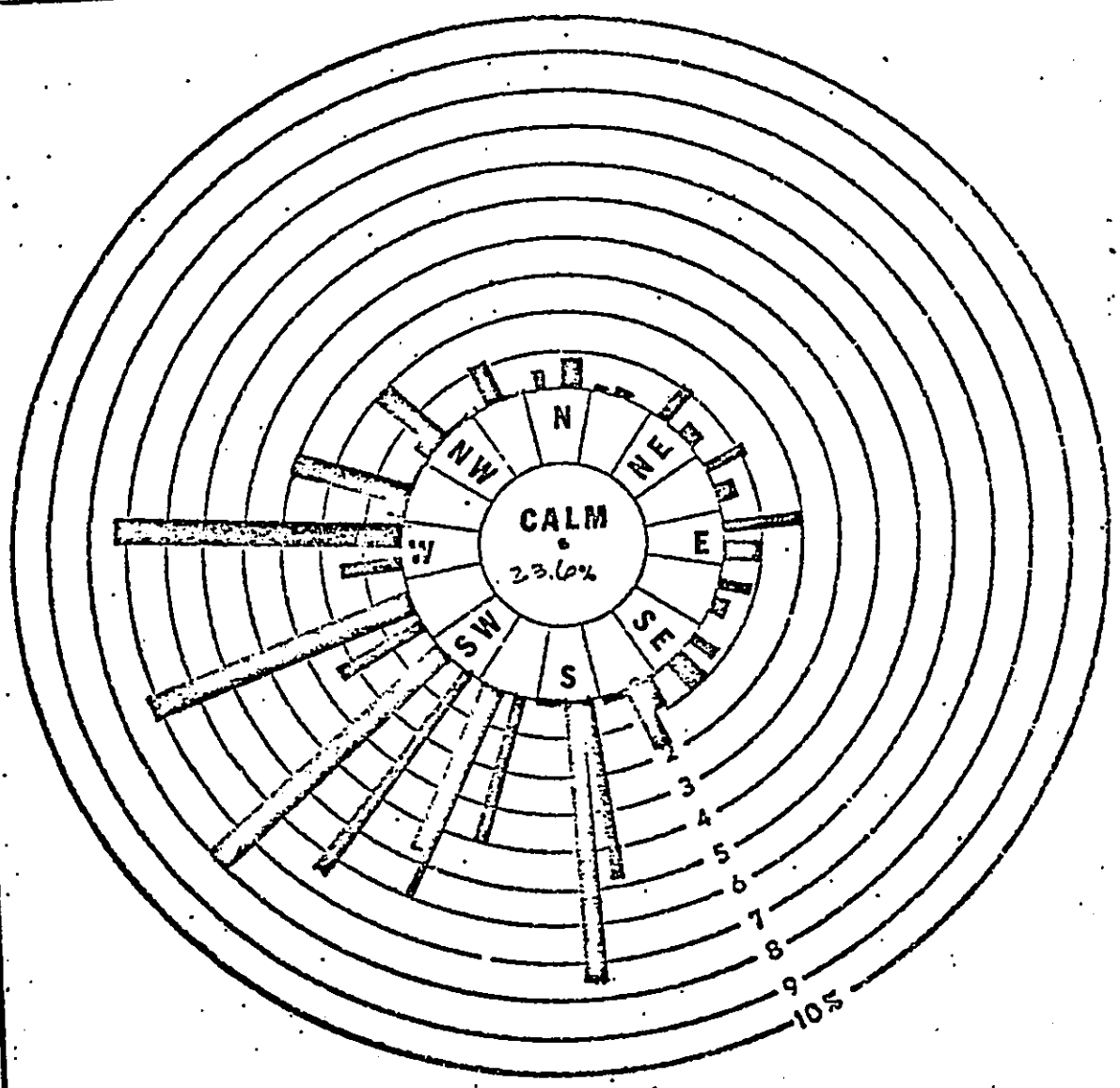


EXHIBIT D	MEAN TEMPERATURE
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH



LEGEND:

MPH
3 - 7
8 - 18
19-24
OVER 24

Based on Daytime Observations (approximately 7:00 am to 5:00 pm)

Period of Record
1957-65

Source
Honolulu U.S.W.B.

EXHIBIT E — ANNUAL WIND DIAGRAM - KAILUA-KONA AIRPORT

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

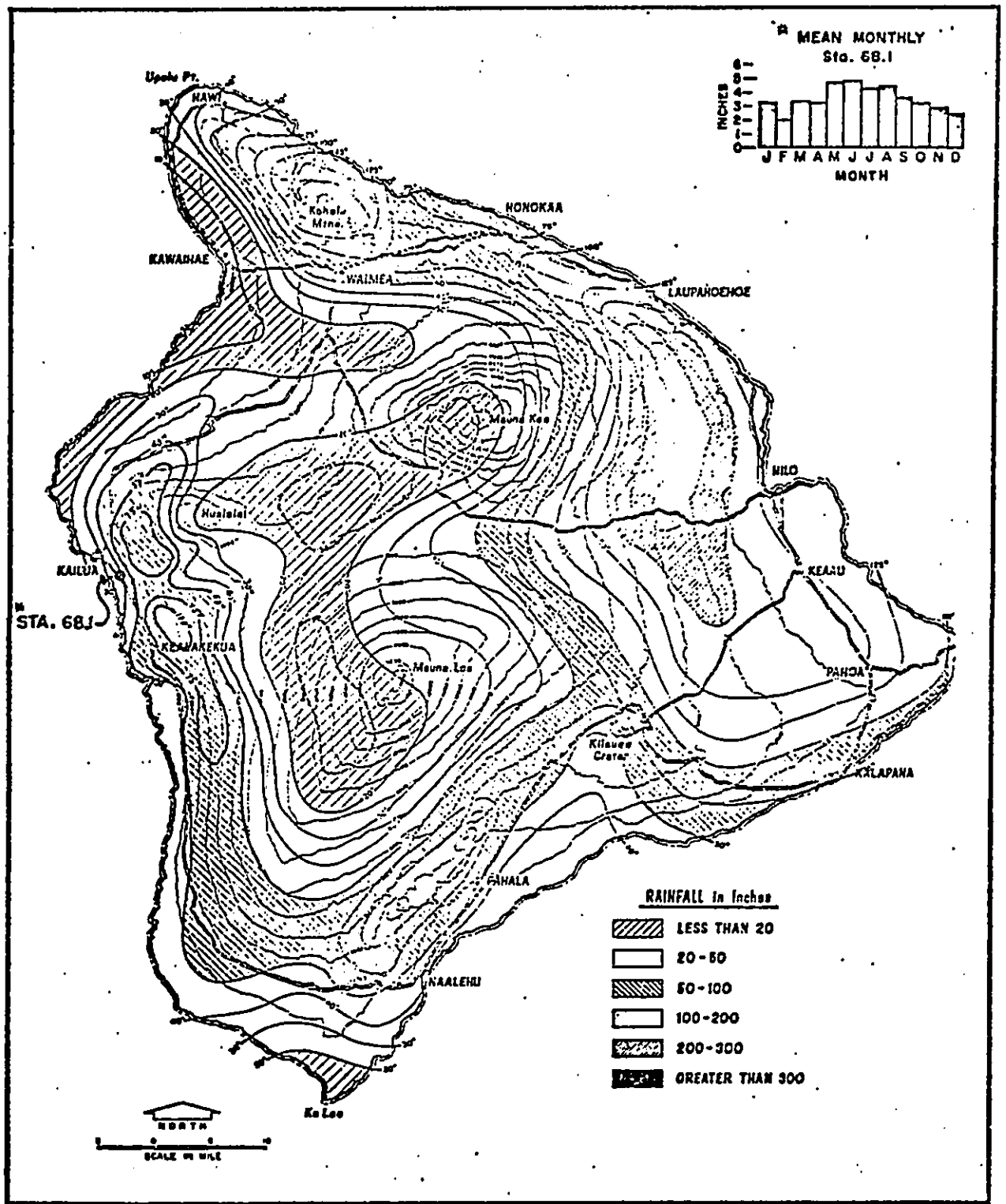


EXHIBIT F	MEAN ANNUAL RAINFALL

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

showers. This rainfall is typically spotty in distribution and highly variable in duration and intensity, but the showers are frequent and heavy enough to produce a much higher mean rainfall in Kona than in other leeward areas.

Relatively infrequent but significant cyclonic disturbances disrupt the prevailing tradewind circulation and cause heavy rainfall. These disturbances, locally called "Kona Storms" usually occur during the winter months, are accompanied by winds from a southerly-southwesterly direction, and often account for most of the annual rainfall in the areas leeward of the mountain masses.

The rainfall map of the island of Hawaii shown in Exhibit F indicates the mean rainfall for the alternative sites will vary from 30 to 40 inches and the rainfall distribution throughout the year is fairly even.

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JAN 25 11 34 AM '77

DIV. OF PUBLIC WORKS
DAGS

January 19, 1977

- SS

MEMORANDUM

To: Dr. Richard E. Marland, Director
Office of Environmental Quality Control

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Kailua-Keauhou Elementary School

Thank you for allowing us to review and comment on the subject EIS. Please be informed that we have no objections to this project.

We submit the following environmental health concerns for your consideration:

1. A package sewer treatment plant which is not functional 3 months of the year (summer vacation) may create operational maintenance problems resulting in odor nuisances.

2. The warmer climate in the proposed school sites requires consideration for providing natural ventilation or air conditioning to maintain comfortable temperatures.

3. The dog fly population is a chronic problem along the Alii Drive area.

4. Specifically, we refer you to Public Health Regulations, Chapter 38, Sewage Treatment and Disposal Systems. Approval of the package STP is required from the Department of Health.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

James S. Kumagai

JAMES S. KUMAGAI, Ph.D.

cc: DHO, Hawaii
Department of Accounting & General Services

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)1118.7

MAR 15 1977

Dr. James S. Kumagai
Deputy Director for
Environmental Health
Department of Health
State of Hawaii
Honolulu, Hawaii

Dear Dr. Kumagai:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your January 19, 1977 review comments to the Office of Environmental Quality Control on the subject document. The following response to your environmental health concerns are provided:

1. Although the package sewage treatment plant will be operational throughout the year, it will serve only the clerical and custodial staff during the summer months. The lower sewage flow during the summer could create an odor problem which you mentioned. However, this problem can be eliminated by adjusting the operational controls of the package STP to operate on a schedule to reduce the long periods between processing of the sewage. We will discuss this matter further with the DOH during the design when the size of plant, type, etc., will be determined.

2. The planning and design of the school will consider orientation, configuration and placement of buildings to provide good natural ventilation. This natural ventilation should be comparable to that provided in the homes of the community it will serve. The Department of Education's current facility standards do not

permit air conditioning of classrooms. However, the Department of Education is reviewing proposed standards for air conditioning school facilities.

3. The dog fly population problem along Alii Drive will be noted in the report.

4. The report will indicate that the proposed package STP will comply with "Provisions of Chapter 38, Public Health Regulations".

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:iy

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DAGS

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

December 21, 1976

Honorable Hideo Murakami
Comptroller
Department of Accounting
and General Services
P. O. Box 119
Honolulu, HI 96810

Dear Sir:

We have reviewed the site selection report and EIS for Kailua-Keauhou Elementary School.

With respect to the question of water availability (p. 41), we suggest that requirements be worked out with the County Water Department.

Although the alternative sites are all outside potential flood and tsunami areas (p. 40), the site selected should be provided adequate drainage facilities. In addition, erosion and sedimentation should be controlled during construction.

Very truly yours,

Edgar A. Hamasu
for CHRISTOPHER COBB
Chairman of the Board

cc: DOWALD
Land Management
Fish and Game

(P)1094.7

FEB 4 1977

Honorable Christopher Cobb
Chairman
Department of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

Dear Mr. Cobb:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your December 21, 1976 review comments on the subject document. We provide the following responses to your comments:

1. The County Department of Water Supply has been contacted regarding the availability of water and their comments are included in the draft EIS.

2. Adequate drainage facilities will be provided and erosion and sedimentation controls during construction will be utilized. As indicated in the draft EIS, the County Department of Public Works and State Department of Health requirements on these items will be followed.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

HS:jnt

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

December 29, 1976

Mr. Hideo Murakami
Director, Department
of Accounting and General Services
Division of Public Works
Attention: Mr. Harold Sonomura

Dear Mr. Murakami:

Subject: Proposed Kailua-Keahou Elementary School: Draft Site Selection Report and EIS, Hawaii Island

Thank you for the opportunity to comment on the draft EIS for the subject undertaking.

This office concurs with your statement regarding the need for an archaeological survey on page D-15.

Please notify this office when the final site is selected. At that time we will be happy to assist your office in ensuring that a proper archaeological survey is conducted.

Sincerely yours,

Jane L. Silverman
Historic Preservation
Officer
State of Hawaii

(P)1091.7

FEB 3 1977

Miss Jane L. Silverman
Historic Preservation Officer
Department of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

Dear Miss Silverman:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your review comments on the subject draft report. We will contact your office for assistance in conducting an archaeological survey after a specific school site is selected.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt
cc: Mr. C. Cobb

NOV 3 1977

(P)2149.

Ms. Jane Silverman
Director
Historic Sites Section
Department of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

Dear Ms. Silverman:

Subject: Proposed Kailua-Keauhou Elementary School
Draft Site Selection Report and EIS
Archaeological Survey

This is to follow up on the October 31, 1977 telephone discussion with Mr. Farley Watanabe of your staff on the need for an archaeological survey for the subject project.

We have narrowed our site selection choices to the four alternative sites shown on the attached maps. Your assistance in determining the need and the extent of archaeological surveys for the sites is requested before a final site is selected.

If there are any questions, please have your staff contact Mr. Harold Sonomura of the Planning Branch at 548-5703.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt
Attachment

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GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
P. O. BOX 621
HONOLULU, HAWAII 96809

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

FILE NO. _____

December 8, 1977

Mr. Rikio Nishioka
State Public Works Engineer
Division of Public Works
Department of Accounting and General Services
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Nishioka:

Subject: Proposed Kailua-Keauhou Elementary School Draft Site Selection Report and EIS Archaeological Survey

Per your request of 3 November 1977, this office's recommendations are as follows:

1) Alternative sites A, B, F and 1 will each require and archaeological reconnaissance survey to determine the presence or absence of archaeological remains. If such remains are present coordination with this office will be necessary to insure that no significant resources will be adversely affected.

2) The report to be produced by this reconnaissance survey should be incorporated and properly discussed in the final EIS and should include this office's comments.

Sincerely yours,

Jane L. Silverman

Jane L. Silverman
Historic Preservation Officer
State of Hawaii

(P)1555.8

APR 19 1978

Mr. Ralston Nagata
Acting Director
Historic Preservation Office
Department of Land and
Natural Resources
State of Hawaii
Honolulu, Hawaii

Dear Mr. Nagata:

Subject: Proposed Kailua-Keauhou Elementary School
Site Selection Report and EIS
Archaeological Survey

Transmitted is a copy of An Archaeological Reconnaissance Survey by B.P. Bishop Museum for the subject project, for your information. Please note that we are including a discussion of the results of the archaeological survey in the Site Selection Report and EIS which will be distributed for public review shortly. If you have any comments, we would appreciate a response by May 1, 1978.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:lt
Attachment

GEORGE R. ARIYOSHI
GOVERNOR

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STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

~~RICHARD E. MARLAND, PH.D.~~
DIRECTOR

TELEPHONE NO.
548-6915

January 4, 1977

MEMORANDUM

TO: Hideo Murakami, State Comptroller
Department of Accounting and General Services

FROM: Richard E. Marland, Director
Office of Environmental Quality Control

SUBJECT: Draft Site Selection Report and Draft Environmental Impact Statement for Kailua-Keauhou Elementary School Kailua, Kona, Hawaii

This Office has reviewed the subject draft report and draft environmental impact statement. We offer the following comments:

The statement of need for the Kailua-Keauhou Elementary School should contain the enrollment growth figures for Kealakehe Elementary. The distances traveled by the school children and the consequent traffic and safety problems could also be mentioned as determinants for the need of the new school.

Based on the information provided in the site selection report's sections on site evaluation criteria, community site criteria and estimated costs, sites G, B and C would appear to be the favorable sites. We note that site H would be out of the way for most of the students and that sites D and E would be near a concrete plant. It is also apparent that the location of the school is dependent, in part, on the choice of serving the present population at a nearby suitable location or siting it so as to serve the estimated population growth of the service area. The growth-inducing impacts of siting the school will have to be considered in the EIS.

Good access will affect the choice of the school's location. This should be evaluated with the nearness of the school to sources of air pollution and noise such as a major highway, which would affect the teaching environment and the environmental health of the users of the facility. An example

of this is seen with site G, being next to Kuakini Highway.

Has consideration been given to the potential expansion of the county run Hele-On Bus system to service the proposed school? Would this affect the estimated bus subsidy costs?

The statements on potential environmental impacts in the draft EIS are quite general. We suggest that the sections on air quality and noise include present conditions and potential changes that might affect the users of the school facility. There exists some noise and air quality data for this area in the EIS for Kuakini Highway Realignment which may be useful in your analysis. The EIS contents should adhere to the content requirements of the EIS Regulations, Section 1:42.

On page D-11 in the last sentence of the second paragraph we believe the word faculty should be used in place of facility.

Within the Environmental Protection provisions (page D-23) the citation to Chapter 31 - Air Pollution should be Chapter 43, of the Public Health Regulations of the State Department of Health.

An alternative might be year-round use of the present schools. Has this been considered?

We trust that our comments will prove useful to you in the selection of the school site and the preparation of the EIS for this action. Thank you for the opportunity to review this draft site selection report and draft EIS.

Sincerely,

Richard E. Marland
Director

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P)1323.7

MAR 29 1977

Dr. Richard Marland
Director
Office of Environmental
Quality Control
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

Dear Dr. Marland:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your January 4, 1977 review comments on the subject document. We have the following responses to offer:

1. Table 1 of the site selection report will be expanded to show the enrollment projections for Kealakehe Intermediate, Kealakehe Elementary and Kailua-Keauhou Elementary Schools. As stated in the report, the need for the new school is to preclude an excessive enrollment level at Kealakehe School. Although travel distances and traffic safety factors for students will improve with development of the proposed school, they were not factors in determining the need for the new school.

2. The possible growth-inducing impact of the new school development mentioned on page D-11 of the EIS was in relation to whether or not a new school was to be provided rather than its location in the service area. Although we mention this possibility, there is no convenient way to determine if there is any impact at all. Previous overcrowded schools throughout the State indicates the inadequacy of school facilities does not deter people from moving into the service area.

3. Good access will definitely affect the choice of the school's location, especially since much of the service area is still undeveloped. This item and other environmental concerns such as highway noise, aircraft noise, industrial and agricultural nuisances are considered in the evaluation. See Item No. 5 for statements on air quality and noise.

4. No consideration has been given to the expansion of the County's Hele-On Bus system to service the proposed school site at this time. At present, the only County bus available in the morning for students leaves Hookena at 6:00 a.m., travels along Mamalahoa and Kuakini Highways and arrives in Kailua at about 7:00 a.m. A second bus which leaves Hookena at 8:45 a.m. and arrives in Kailua at 9:45 a.m. would be too late for students. A preliminary inquiry with the County transit system indicated that it may be possible to adjust the County's bus schedule and routing to service some of the students. However, this will depend upon the location of the school and the number of potential riders. We believe a major expansion of the County's Hele-On Bus system will be required to adequately serve the students and that such a system will be more expensive than providing special school buses that pick up students near their homes and drop them off at school.

5. It is certainly our intent to comply with the content requirements of Section 1:42 of the EIS Regulations. In preparing the Draft EIS, we have attempted to provide the essential details needed for evaluation and review of the environmental impact of the project. Please note that with this in mind, we recently began including the site selection data in the EIS and have prepared the EIS covering all the alternative sites rather than just the site selected. The sections on air quality and noise are contained under "Probable Impact of the Proposed Action (School) on the Environment". Since your suggested statements concern impact of the environment on the school, the following statements will be inserted in the section "Description of Environmental Setting":

"Air pollution from motor vehicle emissions is not expected to have any significant impact on the local air quality. The Department of Health's analysis for the Kuakini Highway Realignment

project indicates the estimated daily and peak hour emission rates for carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxide (NOx) would decrease between 1975 to 1985 without the proposed highway improvements. Implementation of the proposed improvements shown in Exhibit C would further decrease the CO and HC emissions but would increase the NOx emissions. This increase in NOx emissions would not have a significant impact on overall ambient air quality. 1/

1/ July 18, 1974 letter from Dr. Walter Quisenberry, Department of Health Director to E. Alvey Wright, Department of Transportation Director."

"The anticipated exterior L_{10} traffic noise levels during 1995 peak hour conditions are 75 and 81 dBA for two locations along the existing Kuakini Highway and 64 dBA for one location adjacent to the proposed Kuakini Highway Realignment. The values were computed by the State Department of Transportation using the National Cooperative Highway Research Report No. 117 'Highway Noise - A Design Guide for Highway Engineers'. 2/

2/ Draft EIS prepared by the State Department of Transportation for the Kuakini Highway Realignment Project No. RF-011-1(14) and distributed March 8, 1976."

6. The typographical error on page D-11 will be corrected to indicate "faculty" in lieu of "facility".

7. The reference to the former Chapter 31 - Air Pollution on page D-23 will be amended to Chapter 43 - Air Pollution Control to reflect the latest revision of the DOH Public Health Regulations.

8. The possibility of year-round use of the present school will be included as an alternative to the EIS. However, this alternative is not desirable at this time because a four-quarter, year-round school schedule was tried at Konawaena Elementary and High Schools during schools years 1969-71. The results of the two-year pilot project showed that the year-round school, while philosophically sound, required the attendance of a minimum number of students, which in Kona did not materialize. For example, at Konawaena High and Intermediate, only 88 out of 1,100 students chose the December start date the first year and this number declined to 29 the second year. Based on the above, the

Board of Education accepted the Superintendent's recommendation that the Kona Four-Quarter Schedule be discontinued and all Kona schools be placed on the September-June schedule effective 1971-72 school year. 3/

3/ Kona Three-Term Schedule Project Evaluation 1971-72, Office of Instructional Services, Evaluation Section, Department of Education, State of Hawaii, November 1972.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

GEORGE ARIYOSHI
Governor

HIDEO KONO
Director

FRANK SKRIVANEK
Deputy Director

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December 29, 1976

Ref. No. 2631

MEMORANDUM

TO: The Honorable Hideo Murakami, State Comptroller
Department of Accounting and General Services

FROM: for Hideto Kono, Director Frank Skrivanek

SUBJECT: Draft Kailua-Keauhou Elementary School Site Selection Report and Environmental Impact Statement

We have reviewed the subject Site Selection Report and EIS and wish to offer the following comments for your consideration during the preparation of the Final EIS.

Regarding the Site Selection Report, it seems that the study has provided an adequate evaluation and rating of the various advantages and disadvantages relating to each of the eight alternative sites proposed for the school.

The Draft EIS appears to be satisfactory in generally assessing the probable impacts of constructing the proposed elementary school on any one of the eight alternative sites. This is adequate at this point since the final site selection has not yet been made. However, after a site has been selected, it would seem reasonable to expect that the Final EIS should also assess any probably impacts peculiar to the chosen site.

We appreciate the opportunity to review and comment on this Draft Site Selection Report and EIS.

(P)1097.7

FEB 4 1977

Honorable Hideto Kono
Director
Department of Planning and
Economic Development
State of Hawaii
Honolulu, Hawaii

Dear Mr. Kono:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii
Ref: 2631

Thank you for your December 29, 1976 review comments on the subject draft report. We note your comment that "after a site has been selected, it would seem reasonable to expect that the Final EIS should also assess any probable impacts peculiar to the chosen site".

We would like to point out that the draft EIS assesses the environmental impact of developing a school at each alternative location. It discusses the general conditions which affect all of the sites and the specific conditions applicable to each particular site.

Please note that the final EIS will also be prepared on the basis of selecting any one of the alternative sites for the proposed school and that the site selection will be made later.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

HS:jnt

GEORGE R. ARIYOSHI
GOVERNOR

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ANDREW I. T. CHANG
DIRECTOR OF SOCIAL SERVICES & HOUSING

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING

P.O. Box 339
Honolulu, Hawaii 96809

December 9, 1976

Department of Accounting and General Services
1151 Punchbowl Street
P.O. Box 119
Honolulu, Hawaii 96810

Gentlemen:

RE: Draft Site Selection Report and Environmental Impact Statement Kailua-Keauhou Elementary School, Kailua, Kona, Hawaii

We have reviewed the Report and EIS and have no comments to offer relating to our program areas.

We are returning the EIS for your usage. Thank you for the opportunity to review and comment.

Sincerely,

Andrew I.T. Chang
Director

Attachment

GEORGE R. ARIYOSHI
GOVERNOR

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

E. ALVEY WRIGHT
DIRECTOR

DEPUTY DIRECTORS
WALLACE AOKI
RYOKICHI HIGASHIO
DOUGLAS S. SAKAMOTO
CHARLES O. SWANSON

IN REPLY REFER TO:
STP 8.4047

January 7, 1977

Mr. Hideo Murakami
State Comptroller
Department of Accounting
and General Services
State Office Building
Honolulu, Hawaii 96813

Dear Mr. Murakami:

SUBJECT: DRAFT SITE SELECTION REPORT AND ENVIRONMENTAL IMPACT STATEMENT, KAILUA-KEAUHOU ELEMENTARY SCHOOL, KAILUA-KONA, HAWAII

In reference to the above-captioned document, we have the following comments to make:

A. Site C

1. Unsafe location under present traffic and alignment conditions.

2. Channelization and realignment of reverse curve would be required if site is selected.

3. Additional accesses should be made available from Alii Drive and/or Alii Highway to lessen congestion on Kuakini Highway.

4. Undesirable traffic noise generated from Kuakini Highway..

B. Site G

1. Undesirable traffic noise generated from Kuakini Highway.

2. Access should be off the Kilohana Subdivision Road.

3. Most of the school traffic, if not all, will be coming off Kuakini Highway. This will add to the congestion on Kuakini Highway.

C. In our judgment, we consider Site B favorable. Site C is favored over Site G provided the realignment of Kuakini Highway is completed. Should either Sites C or G be selected, we recommend that the school be set back 20-40 feet away from the highway right-of-way.

Sincerely,

E. Alvey Wright

E. ALVEY WRIGHT
Director

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKA
COMPTROLLER
MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P) 1312.7

MAR 28 1977

Honorable E. Alvey Wright
Director
Department of Transportation
State of Hawaii
Honolulu, Hawaii

Dear Admiral Wright:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii
Ref: STP 8.4047

Thank you for your January 7, 1977 review comments on the subject document. We have the following responses to your concerns:

A. Site C

1. The plans will be revised as shown on the attached map to provide vehicular access from the proposed Alii Highway and the proposed Konawai Subdivision roadways. This change should minimize traffic hazards from Kuakini Highway.

2. Channelization and realignment of the reverse curve would not be required based on our revised access.

3. Future access will be provided from Alii Drive and Alii Highway through the proposed subdivision roadways.

4. The potential traffic noise from Kuakini Highway is being considered in the site evaluation process.

B. Site G

1. The potential traffic noise from Kuakini Highway is being considered in the site evaluation process.

2. Access will be provided from the Kilohana Subdivision roadway.

Ltr. No. (P)1312.7

3. We agree that most of the school's traffic will initially be off of Kuakini Highway. However, a large percentage of the students will be bused to school. We also anticipate that future expansion of the Kilohana Subdivision will provide a secondary access from the proposed Alii Highway.

C. Sites B, C and G

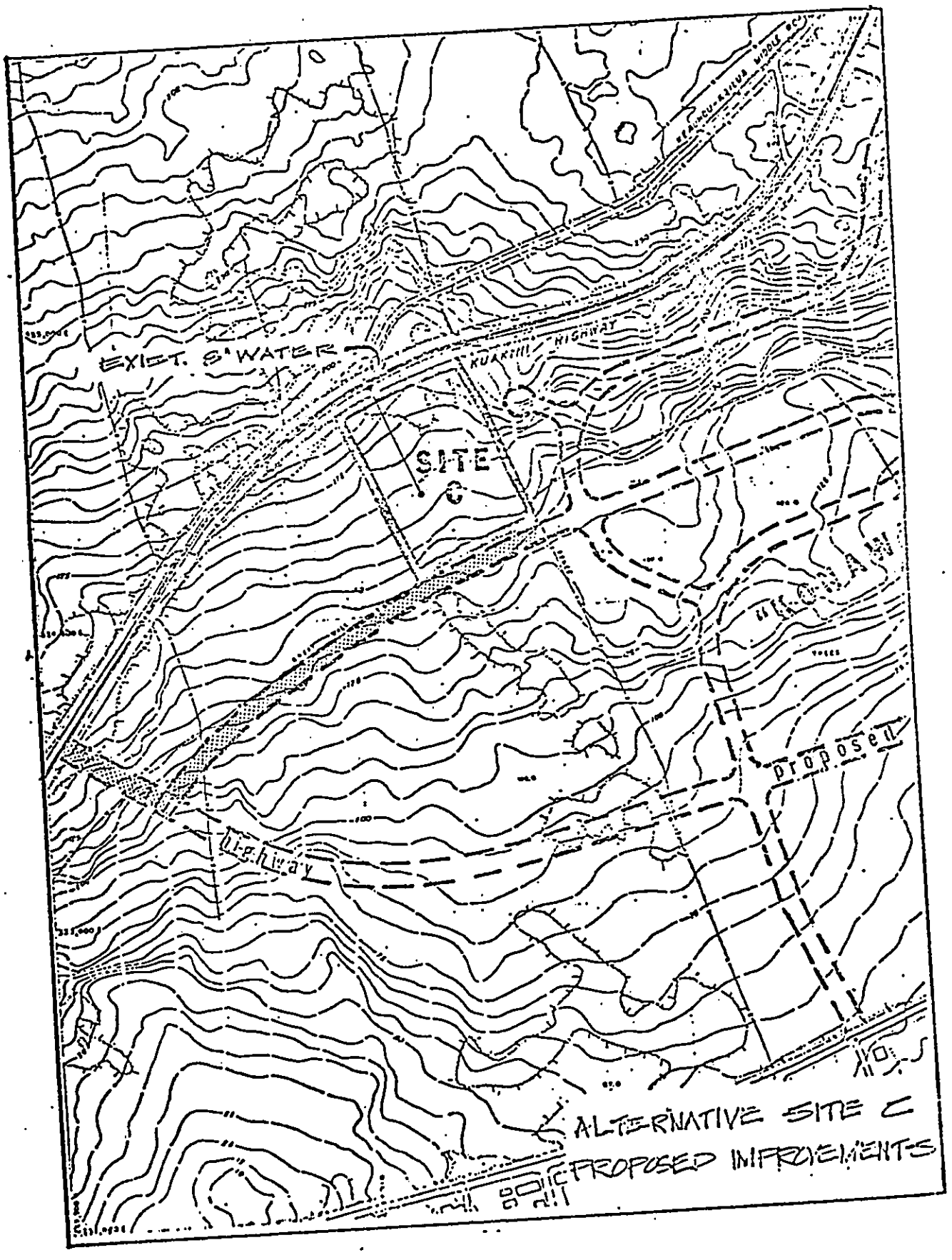
1. Your preference for Site B will be considered in the final school site selection.

2. If either Site C or Site G is selected, the school will be planned with the playground area adjacent to the highway and the school buildings as far as possible from the highway to minimize noise disturbances.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

Attachment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C
proposed
highway
ALTERNATIVE SITE C
PROPOSED IMPROVEMENTS

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University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

January 17, 1977

MEMORANDUM

TO: Dept. of Accounting and General Services

FROM: Doak C. Cox

RE: Draft Site Selection Report and Environmental Impact Statement for Kailua-Keauhou Elementary School

Because of time limitations during the period of review for the above cited documents, the Environmental Center was unable to coordinate and prepare a review. This does not imply that we had no comments to offer, but that unfortunately time did not permit even a preliminary glance at the DEIS.

Doak C. Cox, Director

AN EQUAL OPPORTUNITY EMPLOYER

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DEPARTMENT OF PARKS & RECREATION — Herbert Matayoshi, Mayor

COUNTY OF HAWAII — Milton Hakoda, Director

December 30, 1976

Mr. Hideo Murakami
State Comptroller
Dept. of Accounting and General Services
1151 Punchbowl Street
P. O. Box 119
Honolulu, Hawaii 96810

SUBJECT: Draft Site Selection Report and Environmental Impact Statement
Kailua-Keauhou Elementary School

The Department of Parks and Recreation of the County of Hawaii would like to submit the following comments on the subject report:

(1) We agree with the report that the ideal "site characteristic" for a school development would be one that is built adjacent to a public park. As far as all of the proposed sites for the Kailua-Keauhou School are concerned, we are not presently committed to develop a park or playground anywhere near those proposed sites. We, however, do recognize that there is a need for a park or playground of about five acres to meet the active recreational pursuits of the people within the proposed school's service area. Therefore, we would certainly like to see that acquisition includes purchasing enough land for a school-park site. The park will enhance the "site characteristic" needs of the school and still satisfy the active recreational needs of the people from that area.

(2) We also agree that the proposed school's service area is one that will continue to experience population growth and there is always the possibility that the school will also be required to expand its facilities to coincide with this growth. Therefore, we feel that a 10-acre site is inadequate to meet both the school and park needs, as far as space allocation is concerned. We would like to recommend that at least 15 acres be considered in the initial taking, with respect to proper configuration, minimal sloping and with adequate buffers between the site and flood and tsunami zones.

•25 AUPUNI STREET • HILO, HAWAII 96720 • TELEPHONE 961-8311

(3) Although we do have some concerns about access and drainage, we assume that these will be adequately covered through responses from more qualified agencies.

Thank you for allowing us to review the subject report.

MILTON T. HAKODA
Director

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)1316.7

MAR 28 1977

Mr. Milton Hakoda
Director
Department of Parks & Recreation
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Hakoda:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your review comments of December 30, 1976 on the subject document. The following responses are provided:

1. The DOE's educational specifications permit the development of school-park complexes. However, if a school-park complex is to be provided, the DOE will acquire only the land area necessary for the school buildings while the County would acquire and develop the park site. Since your department is not presently committed to develop a park or a playground in this area, we will proceed with the project of selecting a school site. The school's playground would still be available for community use after school.

2. The DOE has reduced the size of the proposed school site from 10 to 7 acres based on the ultimate enrollment of 630 students and the current DOE standard for school sites. Any additional acreage over the 7 acres required for the school would have to be acquired by the County if a park is to be developed adjacent to the school.

3. Access and drainage concerns will be resolved through consultation with the appropriate governmental agencies.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

COUNTY OF
HAWAII

PLANNING DEPARTMENT

25 AUPUNI STREET • HILO, HAWAII 96720

HERBERT T. MATAYOSHI
Mayor
RAYMOND H. SUEFUJI
Director

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December 14, 1976

Department of Accounting and
General Services
1151 Punchbowl Street
P. O. Box 119
Honolulu, Hawaii 96810

Attn: Mr. Harold Sonomura

Re: Draft Site Selection Report and
Environmental Impact Statement
Kailua-Keauhou Elementary School
Kailua-Kona, Hawaii

Thank you for the opportunity to review the above. Our comments are:

1. On page 39, the document states that a General Plan amendment would be required before a school can be constructed on alternative sites B and E. Such amendments will not be required.

2. Site D is currently zoned RS-7.5 and Unplanned. Your document currently describes the existing zoning as RS-7.5.

3. Forty-four (44) parking stalls are proposed for the new school. The required number of parking stalls will have to be determined upon reviewing your detailed construction plans. Whether or not the proposed 44 stalls will be adequate will be determined during the Plan Approval process required by our County Zoning Code.

We look forward to reviewing your final EIS as well as to providing you input on the final site selection.

Raymond Suefuji
Director

RN:mh

cc Chief Engineer

(P)1095.7

FEB 3 1977

Mr. Raymond Suefuji
Director
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Suefuji:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your December 14, 1976 review comments on the subject document. We would like to provide the following responses to your concerns:

1. The report will be amended to indicate that the General Plan amendments would not be required for alternative sites B and E.

2. The zoning for site D will be shown as RS-7.5 and Unplanned rather than just RS-7.5.

3. The proposed 44 parking stalls are a preliminary count and will be verified with your office when the design of the school is initiated.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

HERBERT T. MATAYOSHI
MAYOR

EDWARD K. HARADA
CHIEF ENGINEER

BUREAUS AND DIVISIONS:
AUTOMOTIVE EQUIPMENT & MOTOR POOL
BUILDING CONSTRUCTION & INSPECTION
PLANS AND SURVEYS
ROAD CONSTRUCTION AND MAINTENANCE
SEWERS AND SANITATION
TRAFFIC SAFETY AND CONTROL

COUNTY OF HAWAII
DEPARTMENT OF PUBLIC WORKS
25 AUPUNI ST.
HILO, HAWAII 96720

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December 10, 1976

Mr. Hideo Murakami
State Comptroller
Department of Accounting and
General Services
State of Hawaii
P. O. Box 119
Honolulu, HI 96810

SUBJECT: Letter No.(P)2240.6
Draft Site Selection Report and Environmental Impact Statement
Kailua-Keauhou Elementary School, Kailua-Kona, Hawaii

We have the following comments.

Page 63 - Table 28, Evaluation Summary

We suggest that further explanation be given to Roadway (B-1) and to Accessibility (C-1 to 5). Did the ratings consider the creation of congestion on roadways, need for left-turn pockets, pedestrian walkways and/or safe vehicle and pedestrian crossings of the main thoroughfares?

Updating of our November 25, 1975 letter.

Item 2. Existing Alii Drive.

Phase II has been completed.

Phase III plans are completed and construction funds are being requested in the FY 1977-78 C.I.P. budget. Tentatively, the starting date will be August, 1977 with completion in December, 1977.

Should you have questions or need for further assistance in the site selection process, please feel free to contact this office.

EDWARD HARADA, Chief Engineer

cc: Planning Department
Department of Water Supply

(P)1093.7

FEB 3 1977

Mr. Edward Harada
Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Harada:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your December 10, 1976 review comments on the subject document. The following responses to your concerns are provided:

1. The evaluation factors for Roadway and Accessibility are provided on pages A-4 through A-6 of the site selection report. Specifically, item (B-1) is used to differentiate the alternative sites with existing roadways from sites which may require widening and/or construction of new roadways. Items (C-1 to 5) evaluate the potential effects of traffic congestion, access and safety factors for each alternative site.

2. The information provided in your November 25, 1975 letter will be updated concerning Phases II and III of Alii Drive improvements.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI

P. O. BOX 1820 • HILO, HAWAII 96720 • 25 AUPUNI STREE

December 7, 1976

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DEPT. OF PUBLIC WORKS
DIV. OF PUBLIC WORKS
DAGS

Department of Accounting and General Services
P.O. Box 119
Honolulu, HI 96810

Re: Kailua-Keauhou Elementary School

We have no adverse comments or objections to the environmental impact statement draft for the subject project.

It is felt that our concerns per letter dated November 17, 1975, attached in the appendix of the environmental impact statement, are sufficient for the selection and planning of the school site.

If we can be of any further assistance, please do not hesitate to contact us. Thank you for the opportunity to review and comment on the project.

Akira Fujimoto
Manager

QA

... Water brings progress...

HAWAIIAN TELEPHONE COMPANY
P.O. BOX 425 • HILO, HAWAII 96720 • TELEPHONE 935-9411 • CABLE: TELHAWAII

RECEIVED
DEC 7 3 10 PM '76
DIV. OF PUBLIC WORKS
DAGS

December 1, 1976

Department of Accounting and General Services
1151 Punchbowl Street
P. O. Box 119
Honolulu, Hawaii 96810

Gentlemen:

Subject: Draft Site Selection Report and Environmental Impact Statement
Kailua-Keauhou Elementary School, Kailua, Kona, Hawaii

This is to acknowledge receipt of the above documents and to inform you that all proposed sites are acceptable from the standpoint of providing telephone communications services.

We request the opportunity to review and offer comments on the routing of telephone communications facilities to the selected site during the preliminary planning stage of this project.

Yours truly,

Hisashi Enomoto
Supervising Engineer

HE/sjm

(P)1096.7

FEB 3 1977

Hawaiian Telephone Company
P. O. Box 425
Hilo, Hawaii 96720

Gentlemen:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your December 1, 1976 review of the subject document. Your office will be contacted after the school site is selected and planning for the school facilities is initiated.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

KAMEHAMEHA
DEVELOPMENT CORPORATION
700 Bishop Street, Suite 601, Honolulu, Hawaii 96813 Telephone: 521-1108 Cable: KAMDEVCO

KEAUHOU-KONA
Resort / Residential Community

RECEIVED
MAR 24 11 24 AM '77
DIV. OF PUBLIC WORKS
DAGS

March 22, 1977

Mr. Hideo Murakami
Comptroller
Department of Accounting and General
Services
P.O. Box 119
Honolulu, Hawaii 96810

Subject: Site Selection Report, Kailua-Keauhou Elementary School, North Kona, Hawaii

Dear Mr. Murakami:

We have received a copy of your November 29, 1976 report outlining an evaluation of alternative sites for this new elementary school. As our company is a major land owner in the Keauhou-Kona resort area, and as the report considers Site H within our property, we have studied your report in detail.

Site H adjoins the existing Keauhou-Kona Golf Course and is quite close to several major resort hotels. The property is zoned for apartment use and is currently under option to a developer for a resort residential apartment complex.

We believe that Site H is too close to a number of resort activities to be an appropriate site for an elementary school. However, we do have long range plans for substantial residential development on lands mauka of the resort area, and believe that an elementary school may appropriately be located within these properties. We would be pleased to discuss this possibility with you whenever it may be deemed appropriate.

Very truly yours,

Guido Giacometti
President

GG/ly

OFFICE OF THE TRUSTEES
519 Halekauwila Street
P. O. Box 3466
Honolulu, Hawaii 96801
Telephone 531-1684
Cable: PAUAHI

RECEIVED
APR 14 12 09 PM '77
DIV. OF PUBLIC WORKS
DAGS

KAMEHAMEHA SCHOOLS / BERNICE PAUAHI BISHOP ESTATE

April 13, 1977

Department of Accounting & General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Attention: Mr. Hideo Murakami
State Comptroller

Gentlemen:

Site Selection Report - Proposed Kailua-Keauhou Elementary School, Kailua-Kona, Hawaii

At their meeting of April 12, 1977, the Trustees of the Kamehameha Schools/Bishop Estate asked that you consider, as one of the alternative sites for the proposed Kailua-Keauhou Elementary School, a location on their lands in Kahaluu, North Kona, just mauka of Alii Drive.

The Kamehameha Development Corporation had previously advised the Trustees that your Site Selection Report of October 1976 had proposed consideration of Site H within its Keauhou-Kona resort area. We understand that Kamehameha Development Corporation was of the opinion that Site H was too close to a number of resort activities to be an appropriate site for an elementary school and suggested that, perhaps, an alternate site on adjoining Bishop Estate lands to the north would be more appropriate.

The Trustees concurred with this position and, therefore, at their meeting of April 12th, voted to advise you that they would be willing to set aside a 7 to 10-acre school site near the north boundary of their Kahaluu lands and mauka of Alii Drive. Preferably, the site should not border Alii Drive but be at least 200 yards mauka of the roadway. A tax map indicating the proposed vicinity is enclosed.

The Trustees indicated that they would convey this site to the State of Hawaii now at appraised market value. They have not had this area appraised but believe that present market value may be about $45,000 per acre.

In lieu of an outright purchase at this time, the Trustees expressed their willingness to issue a long-term lease on the suggested site to the State of Hawaii with an annual rent for the first 10 years of 4-1/2% on the market value at the time of issuance of the lease. It is proposed that this lease would include an option to purchase the school site within the first 10 years of the lease term at the aforesaid market value provided that the State of Hawaii assures the Trustees that the architectural design of the school will be at least equal in quality to the best designs for this class of school now existing in the State.

Since the site offered is within an area tentatively planned for single-family and multiple family housing related to the resort facility, the Trustees ask that the State use every reasonable means to insure that the design of the school in this location will complement the proposed development.

We trust that you will find our proposal worthy of consideration. Should you have any questions or wish to discuss this matter, I would be pleased to meet with you or your representatives. You may contact me by telephone at 531-1684.

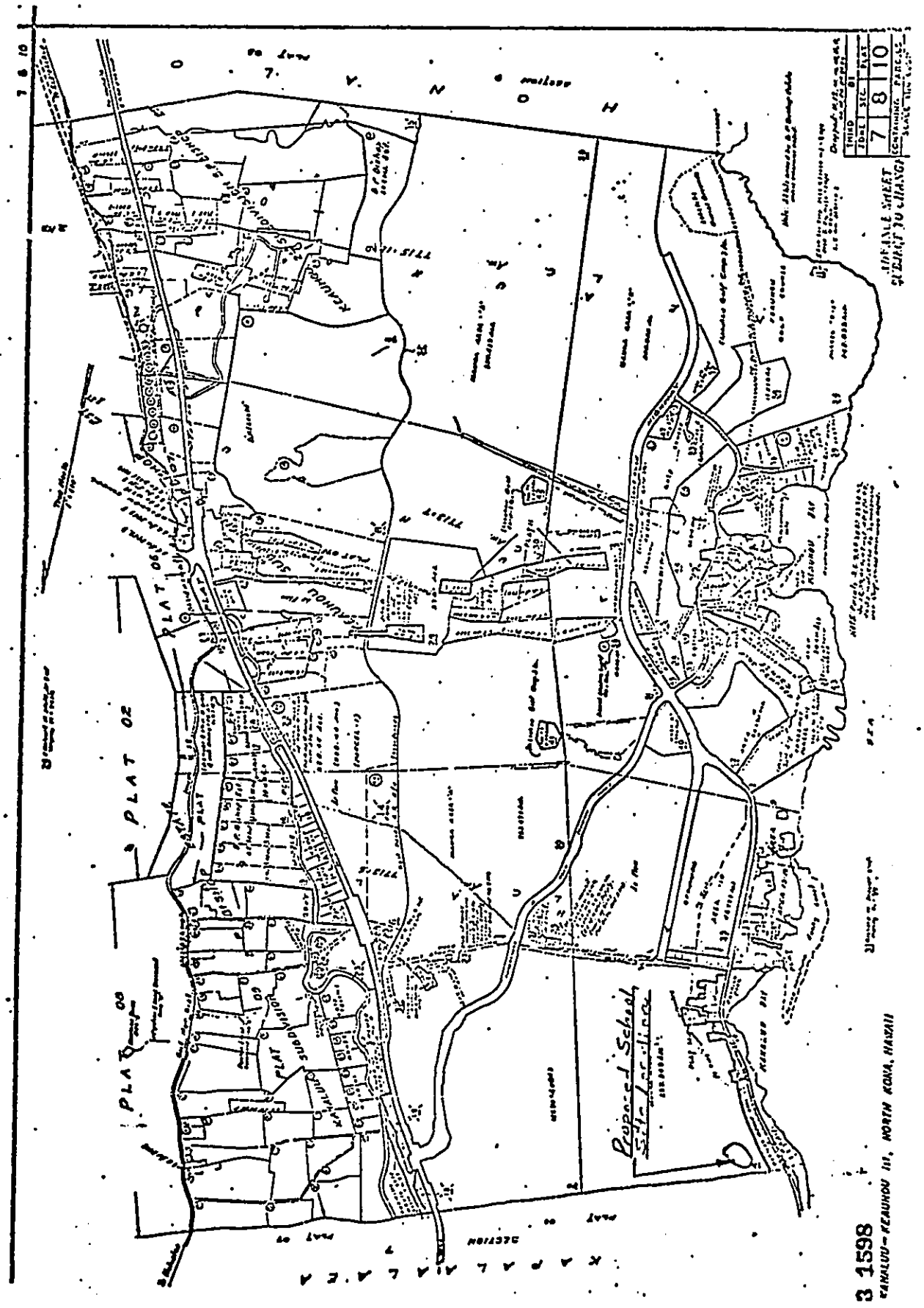
Very truly yours,

Lawrence Cunha

Lawrence Cunha
Area Development Manager

LC bp
Enclosure

cc Mr. Stanley Shin
Planning Division



PLAT 02
PLAT 08
PLAT 09
Proposed School Site Location
3 1598
KAHALUU-KEAUHOU III, NORTH KONA, HAWAII

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKA
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)1904.7

AUG 23 1977

B. P. Bishop Estate
519 Halekauwila Street
P. O. Box 3466
Honolulu, Hawaii 96801

Gentlemen:

Subject: Kailua-Keauhou Elementary School
Site Selection Report and EIS

This is in response to your proposal of April 13, 1977 to consider an alternative site for the subject school project.

We have conducted a preliminary evaluation of your proposed alternative site located in Kahaluu. Since this site satisfies our minimum site selection criteria, we will consider this site in the site selection report.

Please note that the site selection report and EIS will be circulated for public review after the consultation comments are incorporated. If you have any questions, please contact Mr. Harold Sonomura of the Planning Branch at 548-5703.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:nk
cc: Kamehameha Development Co.

RECEIVED

JAN 3 8 34 AM '76

DIV. OF PUBLIC WORKS
DAGS

December 30, 1976

Division of Public Works
PO Box 119
Honolulu, Hawaii 96810

Re: Alternate site for elementary school next to Alii Kai Subdivision

Attention: Mr. Hideo MIRAKAMI

My sister (Mrs. Winona Wong) and I, sole owners of Site "D", have studied the environmental impact statement done on our property.

We have no plans in the immediate future regarding development of this parcel and it is available.

What ever selection is made, we would appreciate a prompt response from you regarding your decision for our record and future plans.

Yours truly,

John Kaelemakule Collins

Mrs. Winona Wong

(P)1099.7

FEB 3 1977

Mr. John K. Collins
1458 Kamenaka Place
Honolulu, Hawaii 96816

Dear Mr. Collins:

Subject: Draft Site Selection Report and
Environmental Impact Statement
Kailua-Keauhou Elementary School
Kailua, Kona, Hawaii

Thank you for your review comments on the subject draft report. The State Department of Land and Natural Resources will contact you if your property is selected for the school site. The selection will be made after the site selection report and environmental impact statement are accepted by the Governor.

Your cooperation with the State on this project will be greatly appreciated.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

KOBAYASHI DEVELOPMENT & CONSTRUCTION INC.
SUITE 901, ATLAS INSURANCE BLDG. / 1150 SOUTH KING STREET / HONOLULU, HAWAII 96814 / PHONE: 521-4624

February 18, 1977

RECEIVED
FEB 23 8 17 AM '77
DIV. OF PUBLIC WORKS
DAGS

Mr. Harold Sonomura
State of Hawaii, D.A.G.S.
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Sonomura:

This is to confirm our telephone conversation of February 7, 1977 with regard to selection of an elementary school site for the Kailua-Keauhou area.

The discussions were primarily centered on the current timetable for selection of the school site by your office and subsequent approval by the Governor. Your statement to me was that an approval will be required on or before June 30, 1977 in order to meet the scheduled opening date of September 1980. You also outlined the requirements still to be met in order to comply with established procedures. Based on the information related to me, it appears that all of the remaining time till mid-1977 will be necessary to fulfill the procedural requirements and in getting the Governor's approval.

I explained to you of our deep concerns on this matter and the need to expedite the selection of the site. With two potential sites (A & B) within our property, it is virtually impossible for us to proceed with our project plans. Our original master plan prepared at considerable cost could be implemented immediately if a site were not within our boundaries. Selection of either site will necessitate a major revision of our master plan. Although our plans submitted to the Planning Department of the County of Hawaii covers the area mauka of the proposed Alii Highway realignment, a plan for the area makai of said highway has also been prepared. A copy of our overall master plan is enclosed for your information. This area was excluded from our Application to Amend the Hawaii County Zoning Map of the North Kona District filed in January of 1974. It was designated as Future Development Area Not Included in this Application in the Master Plan submitted with our application.

We have suspended all activities with regard to this project due to the uncertainty of the final outcome of the school site selection. It is vitally important for us to have this decision rendered at the earliest possible date. I requested notification of the final selection as soon as such decision is rendered to which you concurred. We will greatly appreciate your cooperation

in this regard.

The foregoing generally describes our telephone conversation. We thank you very much for your cooperation and shall look forward to an early decision.

Yours very truly,

Kazuo Omiya, V. Pres.

KO:lm

(P)1229.7

MAR 4 1977

Mr. Kazuo Omiya
Vice President
Kobayashi Development and
Construction Inc.
Suite 901, Atlas Insurance Building
1150 South King Street
Honolulu, Hawaii 96814

Dear Mr. Omiya:

Subject: Kailua-Keauhou Elementary School
Site Selection Study

This is to follow up on your letter of February 18, 1977 and our previous letter of August 16, 1976 regarding the time schedule for the proposed school. Our current schedule still anticipates the selection and approval of a specific school site by July 1, 1977. However, there are many factors beyond our control such as a delay in the school opening date, the availability of funds, or environmental concerns which may delay approval of the final site selection report and EIS. We therefore regret that it is not possible to assure you that the school site will be selected by July 1, 1977.

Please note that we have not requested that you delay your development plans until the school site is selected. You will be notified by the Department of Land and Natural Resources if your property is selected and the land acquisition is authorized by the Governor.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

KOBAYASHI DEVELOPMENT & CONSTRUCTION INC.
SUITE 901, ATLAS INSURANCE BLDG. / 1150 SOUTH KING STREET / HONOLULU, HAWAII 96814 / PHONE: 521-4624

RECEIVED
MAR 14 12 21 PM '77
DIV. OF PUBLIC WORKS
DAGS

February 28, 1977

Mr. Harold Sonomura
State of Hawaii, D.A.G.S.
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Sonomura:

Reference is made to the draft site selection report and environmental impact statement for the Kailua-Keauhou School, Kailua, Kona, Hawaii. In accordance with your recommendation of February 7, 1977, we have reviewed the aforementioned report and wish to offer our comments with respect to the two sites (A & B) located within our property.

The designation of the first ten acre site (site A) requested by D.O.E. after we had finished our master plan and the long delay in initiating the site selection study caused all sorts of problems for us. It disrupted our plans and developmental schedule as it necessitated the modification of our master plan. We decided against changing the master plan due to its high cost and also, because, if our site was not selected the new plan would have been for naught. Further, we were advised by your department at that time that the site selection study would be initiated and determination would be made in a reasonable length of time. A review of our correspondences will bear out this fact.

Since then, more specifically in August of 1976, we were notified of an additional alternative site B being designated within our boundaries. We were really taken by surprise and shocked by this action as we were never consulted on this matter. We were very disturbed by this unfair unilateral action, but we decided not to register a protest as we surmised that you had a legal right to do so under the Hawaii State Statutes.

Our main cause of concern relative to site "B" was due to its location being dead center of an area designated for Resort use under the Hawaii County General Plan. The loss of this resort designated area will have a tremendous impact on our project plans and its feasibility. We are confronted with a big problem which will require a complete overhaul of our plans for the utilization of the remaining acreage in this area makai of the proposed New Alii Drive. The request of a five acre parcel for a park site adjacent to the school by the County of Hawaii will further complicate an already difficult situation.

Sites A & B are both located in prime areas within our property. The topography of both sites are perfect for development purposes requiring only minimal grading. Further, they are not in flood prone areas and out of the tsunami inundation zones. These are desirable characteristics which adds heavily in classifying land as prime. The topography of the major portion of our land is less

than desirable with steep grades which will necessitate extensive grading. Prime areas would reduce the average cost of grading and other construction requirements for the entire parcel. Sites A & B are considered prime and therefore, some premium consideration should be in order.

In your Summary of Salient Facts and Conclusions on page B-1, the indicated price per acre for land is somewhat inconsistent. Site D at $27,500/acre, Site F at $27,000/acre and Site G at $26,000 per acre are all valued higher than our Site A at $23,500.00. We can only surmise that the reason for such a difference in valuation is attributed to Sites D, G & F being zoned "Residential" under the County Zoning whereas Site A is zoned "Unplanned." Under the General Plan, the three sites are designated as low density against alternate urban for Site A. We understand and acknowledge the difference in valuation based on such basis. However, under an Urban Expansion designation, acquiring low density residential or even a higher density RM multiple family residential zoning is readily possible especially in the case of Site A. Our application to amend the Hawaii County Zoning Map of North Kona filed in January 1974 designated the particular area for apartments and requested zoning of RM-2. The application is still pending and is subject to the final outcome of the proposed school site selection. We feel that the value of site A should be higher or no less than that of the other three sites. Further, there were no appreciable differences noted in the Cost Summary, Table 29, page 64 except for lesser off-site development costs for Site F and none for Site G. The total cost excluding land cost was somewhat higher for Site D over Site A. Based on this, it appears that no consideration was given to these cost items in establishing the fair market value of the various sites.

The difference in the appraised value of Site B as compared to Site H is approximately four times in favor of Site H. The County Zoning for Site H is Multi-Family (RM-2) whereas Site B is unplanned. However, the County General Plan designated Site H as Medium Density as compared to Resort for Site B. Also, Site B is strategically located in a very desirable section along Alii Drive. Cost factors are practically the same and should have no bearing on the fair market value. Based on the foregoing, a difference of four times (Site H over Site B) is incomprehensible and a thorough review of the comparables used in this appraisal is in order.

Another cause for concern though somewhat bordering on probability, but, actually being very real, cannot be regarded lightly. If Site B is selected, initiation of our development will most likely be subjected to public opposition. Resort and tourist related businesses will most likely be opposed by reason of non-compatability, creation of attractive nuisances, noise pollution, traffic congestion, hazards, etc. Such reactions are very much in vogue and must be anticipated in any event. Further, the presence of a school in the immediate vicinity will cause a greater reaction. Problems of a technical or physical nature can be quite readily resolved by normal means. Problems related to people involving emotional, philosophical and subjective arguments pose an entirely different type of problem.

In many instances in recent years, public resistance to developments have attained levels of hysteria. Public hearings have been monopolized by strongly polarized resistance groups who only stress irrelevant, emotional and totally subjective points. Compliance with laws and ordinances are oftentimes ignored and only relegated secondary consideration. In view of this fact, we are very concerned of the resulting effect of a school site at this location as it will most likely meet stiff resistance and will ultimately cause a delay of our project for a prolonged period. It would not be too far fetched to even presume the demise of our plans for a tourist oriented project. If you feel otherwise or can offer us positive assurance that such problems will not be encountered or can be reasonably minimized, we will certainly welcome your comments.

The probability of one of the two sites (A or B) located within our property being selected appears to be very strong as it represents two of the eight alternative sites under consideration. This represents two of eight sites, or a one out of four possibility. Four of the eight sites are obviously not acceptable and can be readily eliminated. Of the four remaining sites, two are located within our property. This is a two out of four situation or a 50-50 possibility. The probability of one of the two sites, more particularly Site B being selected appears to be strong or even imminent.

In view of this inevitable situation, we have no alternative but to resign ourselves to this fact. Accordingly, we have realigned our thinking to seek ways in which to cope with the many problems which we will be confronted with. We are inclined to generally agree in principle to accept your decision if so rendered in the establishment of a school within our property. We will cooperate with you in any way possible and sincerely hope that a reasonable agreement can be effected to our mutual benefit.

The foregoing generally describes our concerns and problems (past, present and future) with regard to this matter. We hope this will give you a good insight of our concerns and hope that you will accord due consideration to the matters contained herein. If there should be any questions, please do not hesitate to contact me.

Yours very truly,

Kazuo Omiya, Vice President

KO:lm

GEORGE R. ARIYOSHI
GOVERNOR

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P)1341.7

APR 5 1977

Mr. Kazuo Omiya
Kobayashi Development
and Construction Inc.
1150 South King Street
Suite 901
Honolulu, Hawaii 96814

Dear Mr. Omiya:

Subject: Draft Site Selection Report and EIS
Kailua-Keauhou Elementary School

Thank you for your February 28, 1977 review comments on the subject document. We have the following responses to your concerns:

1. Designation of Site A

Your October 7, 1974 letter to the Department of Education (DOE) agreed to reserve a tentative 10-acre site within the proposed development area for a reasonable period until a site study was completed. The October 16, 1974 response from the DOE indicated that a site study could be initiated within 3 to 6 months and a draft report could be made available within 6 months to 1 year after the study is initiated. Our first correspondence with your office was on August 2, 1976 when a map of the alternative sites under consideration was transmitted with a preliminary time schedule for completion of the site study in January 1977. The completion of the study has subsequently been delayed based upon the need to revise the report to adequately resolve all the concerns which were raised during the review of the draft report.

2. Designation of Site B

This site was included in the evaluation to assess the merits of a site which is accessible off of

Alii Drive. Please note that property owners are not contacted on the location of the alternative sites until the draft site study is prepared for their review and comments.

3. Concern on Site B

This site was selected for evaluation because your master plan designated the area for future development and excluded the area from the zoning application submitted to the County. However, your comments on your development plans for the area will be included in the report and considered in the selection of the school site.

4. Prime Sites and Valuation

The estimated land acquisition costs were prepared by the State Department of Taxation. The appraisal considered items such as State Land Use, County General Plan, County zoning, highest and best use, and utilities available in deriving the land values. One of the the main items to note is that the County Zoning designation and not the General Plan designation determines what can be developed on the land now. Accordingly, although Site B is general planned for "Resort", the "Unplanned" zoning of the site results in a much lower development potential. The other main item concerns the availability of utilities. Therefore, until your land is rezoned to permit a higher use and/or all the utilities are provided to permit development, the estimated appraisals in the report will be used. However, your concern on the fair market value of the sites will be resolved by the courts during the condemnation proceedings of the selected site.

5. Public Opposition

The disadvantages of locating a school near proposed resort or commercial activities are recognized and have been considered in the site selection criteria. The site selection report and environmental impact statement will provide the community an opportunity to voice their opinion for or against a school site in your development. This community opinion will be considered in the selection of the school site. It does not appear that anyone is in a position to assure you that you will not encounter public opposition to your development plans with or without a school site in the vicinity.

6. Selection of Site

The merits of each alternative site including the review comments which we receive on the draft report from governmental agencies, organizations, and property owners are still being evaluated. The selection of the school site will be made after the EIS is approved. We have no comments to offer on the possibility or probability of selecting the school site in your area. Regardless of the site selected, your offer of cooperation is greatly appreciated. Please be assured that your concerns will be given due consideration in the final selection of the school site.

For your information, the Department of Education has reduced the size of the school site from 10 to 7 acres to conform to their latest standard. This will require a revision to the site selection report and EIS. Attached are the revised plans showing Alternative Sites A and B.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:nk 2-3
Attachment

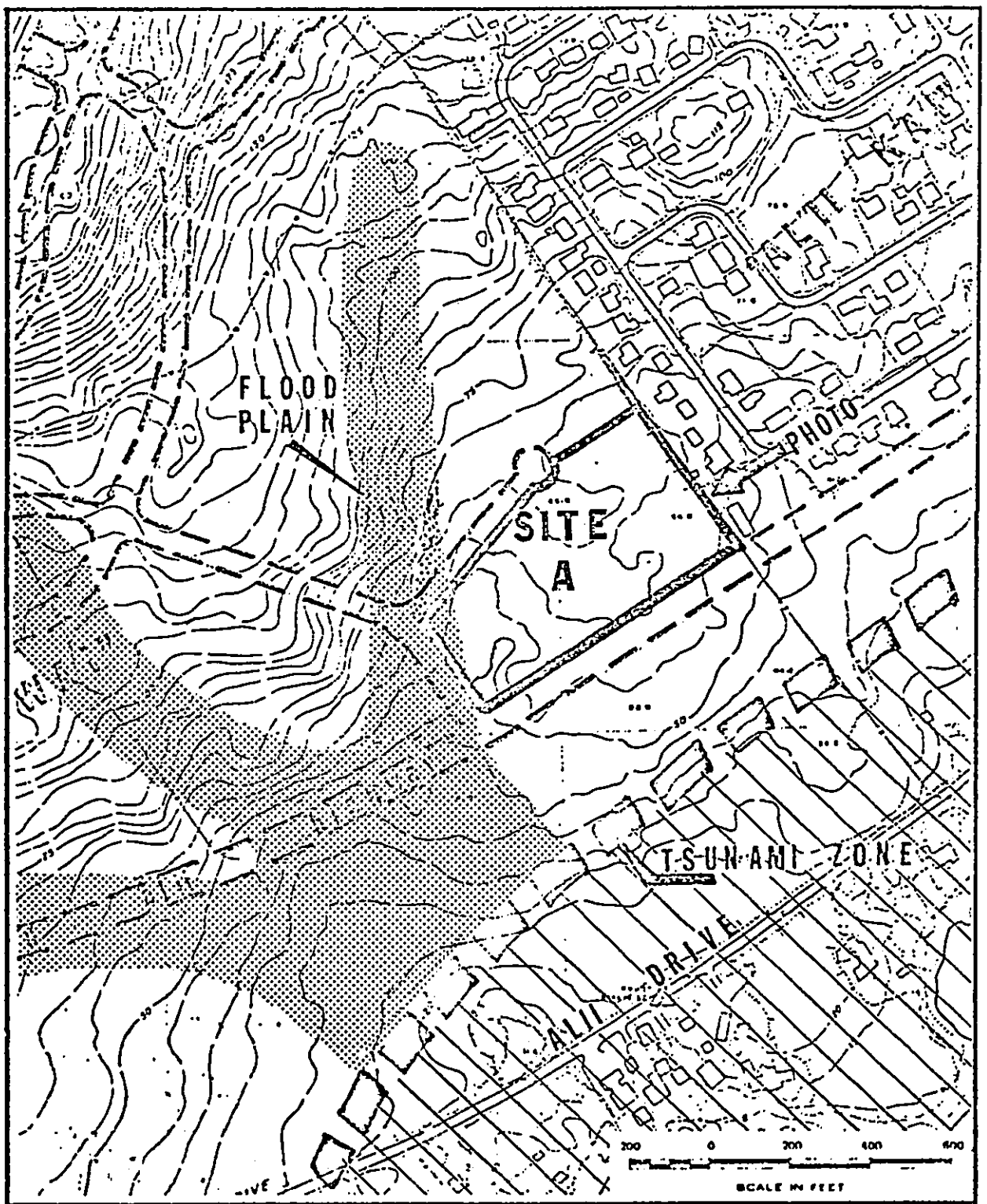


FIGURE 6	ALTERNATIVE SITE A

STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES

DIVISION OF PUBLIC WORKS • PLANNING BRANCH

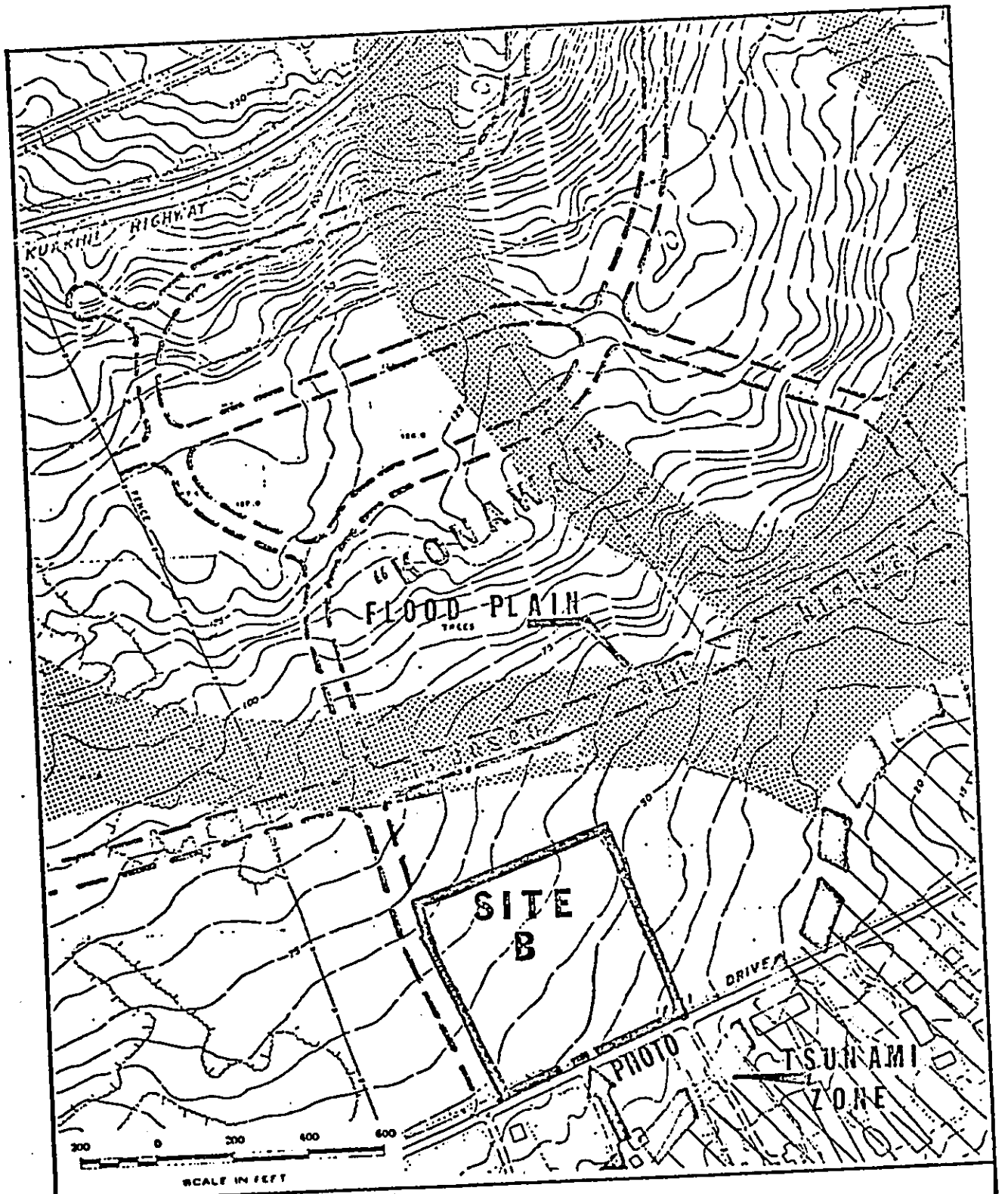


FIGURE 9	ALTERNATIVE SITE B
STATE OF HAWAII • DIVISION OF PUBLIC WORKS	DEPT. OF ACCOUNTING & GENERAL SERVICES • PLANNING BRANCH

KOBAYASHI DEVELOPMENT & CONSTRUCTION INC.
SUITE 901, ATLAS INSURANCE BLDG. / 1150 SOUTH KING STREET / HONOLULU, HAWAII 96814 / PHONE 521-4624

RECEIVED
MAR 14 12 20 PM '77
DIV. OF PUBLIC WORKS
DAGS

March 11, 1977

Mr. Rikio Nishioka
Dep't. of Accounting & General Services
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Nishioka:

Subject: Kailua-Keauhou Elementary School Site Selection Study.

Reference is made to your letter (P) 1229.7 of March 4, 1977, with regard to the above mentioned subject.

We were surprised to learn of the uncertainty of the time schedule because of certain factors which are beyond your control. We were under the impression that the opening date of the school was firmly established. Also, that the funds necessary for said purpose were already appropriated and programed for use at anytime in accordance with your schedule. This not being the case, what is the outlook at the present time with regard to funding and is it to be on a piece meal basis? It would seem that with such limited working time, an important matter such as this would be in a more positive and immediately implementable state. We will appreciate your comments and clarification on this matter.

The possibility of a delay beyond the target date of July 1, 1977 seems to be highly likely and could be for a fairly extended period. This is a very undesirable situation and is of great concern to us. Any extended delay will place us in a most difficult position and cause us serious hardship. It is imperative that this matter be resolved as expeditiously as possible at least within the established timetable.

In any event, the selection should be narrowed down by eliminating those sites which are obviously unsuitable and unacceptable. Thereafter, a priority schedule in the order of its desirability should be established. At this juncture, it appears that you have compiled adequate data and performed a thorough evaluation to make such a determination. In fact, it would not be too far fetched for us to surmise that you do have a priority list in the order of its preference. It would seem to be only proper for you to notify the property owners on the status of the site or sites within their property at an appropriate time prior to the final determination. This would at least give the owners a better idea of their status and some lead time to permit them to proceed with planning or development as the case may be.

As stated in your letter, you have not requested that we delay our development plans until the school site is selected. However, in

our particular case, our development plans cannot be made on a piece meal basis. The County has requested us to present a master plan for the entire parcel due to its use being varied from low density single family dwellings, medium density townhouses to higher density apartments. An amendment to the zoning is necessary in order to proceed with our development. We filed an application to amend the Hawaii County Zoning Map of the North Kona District in January of 1974 and it has been hung up subject to the final determination of the school site. We have spent a considerable amount of time and money for master planning and we cannot afford to revise our plans on the supposition that a site will be established in our property. The reason for this is obvious. If the site is not selected, all the gymnastics at considerable cost would just go down the drain. We would then have to withdraw our revised plans and resubmit our original plans. A close look at our master plan will readily reveal the complexity of our problem. The uncertainty of the final site selection and its prolonged delay has caused a considerable increase in carrying charges.

We have been placed in an immovable position because of this situation. We must get a decision or even an indication on the probability of a site (A or B) being selected as soon as possible. Otherwise, we will be hung up for an indefinite period which would result in serious consequences on our project.

We don't doubt that every effort is being expended to expedite the processing to meet the target date of July 1, 1977. We are aware of the cumbersome and complex requirements which must be followed to comply with established procedures setforth in the State Statutes. However, time is a critical factor and of the essence. It is imperative that this matter be resolved as expeditiously as possible. We are in no way implying that you are dragging your feet nor that you are insensitive to our concerns. Rather, we just want to get this matter settled as soon as possible so that we can reinitiate our development plans.

Your most serious consideration of our urgent plea will be greatly appreciated.

Yours very truly,

Kazuo Omiya, Vice President

KO:lm

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS
P. O. BOX 119, HONOLULU, HAWAII 96810

HIDEO MURAKAMI
COMPTROLLER

MIKE N. TOKUNAGA
DEPUTY COMPTROLLER

LETTER NO. (P) 1385.7

APR 12 1977

Mr. Kazuo Omiya
Kobayashi Development and
Construction, Inc.
1150 South King Street
Suite 901
Honolulu, Hawaii 96814

Dear Mr. Omiya:

Subject: Kailua-Keauhou Elementary School
Draft Site Selection Report and EIS

This is in response to your letter of March 11, 1977 on the subject project. We have the following comments to offer relative to your concerns:

1. Time Schedule - The current schedule for the opening of the proposed school is still September 1980. However, as we indicated to you in our letter of March 4, 1977, we cannot assure you that this date will be met because of the many factors which may delay the actual school opening date. The DOE has programmed the necessary land acquisition, planning, and construction funds for the school to meet the 1980 opening date. We therefore believe that it is possible to proceed with the implementation of the project as soon as the site is selected and the land acquisition proceedings are initiated.

2. Delay - A delay of the final site selection beyond our current target date of mid 1977 is possible. However, we are expediting the project and do not foresee an extended delay if the September 1980 date is to be met.

3. Priority of Sites - Our draft site selection study shows that all of the sites evaluated are potential sites and none of them are "obviously unsuitable

and unacceptable". Although adequate data is available to prepare a preliminary priority list in terms of school criteria, community criteria and cost considerations, none has been prepared. We believe it is premature at this time to make such a list and to notify the property owners because the final site selection will consider other factors such as environmental concerns and review comments from governmental agencies, community groups, and individuals. Since the draft report and EIS have been submitted to all of the affected property owners, we believe that this is adequate notification for each property owner concerning the possible use of their property.

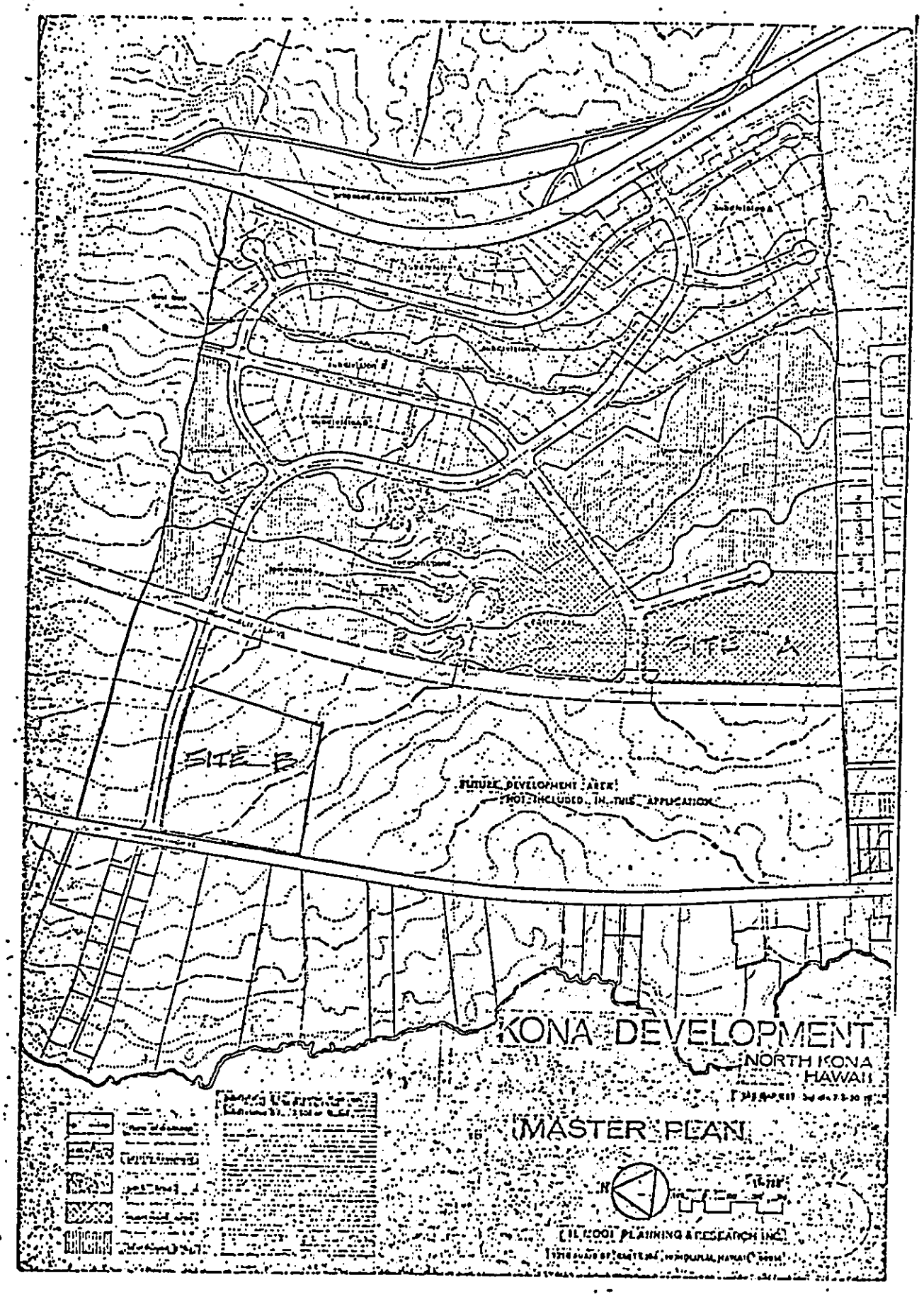
4. Development Plans - The two alternative school sites within your property are shown on the attached copy of the last master plan you submitted to the County. Please note that the site acreage requirements have been reduced to seven acres to reflect current DOE standards. Based on our previous experience with selecting school sites within proposed developments throughout the State, we believe that these two alternative sites do not unduly restrict your development plans. It appears you could get your master plan approved with Alternative Site A shown pending the outcome of our study, request the zoning changes for subdivisions A and B plus some of the townhouse area on the north boundary of your land and proceed with development of these areas. Appropriate adjustment could be made later as required if school site A is selected.

We trust that the above responses answer your concerns. If you have additional questions, please contact Mr. Harold Sonomura of my Planning Branch at 548-5703.

Very truly yours,

for RIKIO NISHIOKA
State Public Works Engineer

HS:nk 2-3
Attachment


SITE A
SITE B
FUTURE DEVELOPMENT AREA
NOT INCLUDED IN THIS APPLICATION
KONA DEVELOPMENT
NORTH KONA
HAWAII
MASTER PLAN
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RECEIVED
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DIV. OF PUBLIC WORKS
DAGS

LAUPAHOEHOE TRANSPORTATION CO., INC.
115 KOLOMUA STREET • HILO, HAWAII 96720 • PHONE: (808) 961-6627

December 13, 1976

Mr. Rikio Nishioka
State Public Works Engineer
Division of Public Works
Department of Accounting and General Services
P. O. Box 119
Honolulu, Hawaii 96710

Dear Mr. Nishioka:

RE: Kailua-Keahou Elementary School Site Selection

We have completed reading your Draft Site Selection report and are pleased to note that our property is being considered as a possible site for the proposed Kailua-Kona Elementary School. Should site C be ultimately selected for the school, we shall be happy to cooperate with the State of Hawaii and other agencies in every way to expedite the construction of the school.

Sincerely yours,

Chiaki Matsuo

Chiaki Matsuo
President

CM:js

(P)1098.7

FEB 3 1977

Mr. Chiaki Matsuo
P. O. Box S
Papaaloa, Hawaii 96780

Dear Mr. Matsuo:

Subject: Draft Site Selection Report and Environmental Impact Statement Kailua-Keauhou Elementary School Kailua, Kona, Hawaii

Thank you for your review comments on the subject draft report. The State Department of Land and Natural Resources will contact you if your property is selected for the school site. The selection will be made after the site selection report and the environmental impact statement are accepted by the Governor.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

HS:jnt

APPENDIX III

Archaeological Reconnaissance Survey

Ms..031078

AN ARCHAEOLOGICAL RECONNAISSANCE SURVEY OF FOUR ALTERNATIVE SITES FOR THE KAILUA-KEAUHOU ELEMENTARY SCHOOL

by

Thomas S. Dye
Department of Anthropology

Prepared for

Division of Public Works
Department of Accounting and General Services
State of Hawaii

March 1978

BERNICE P. BISHOP MUSEUM
Honolulu, Hawaii

D-117

BACKGROUND

At the request of the State of Hawaii, Department of Accounting and General Services, Division of Public Works, members of the Department of Anthropology, B. P. Bishop Museum, conducted an archaeological reconnaissance survey of four alternative sites for the proposed Kailua-Keauhou Elementary School, North Kona, Island of Hawaii. Fieldwork was carried out on February 6 and 7, 1978, under the direction of the author, with the assistance of Holly McEldowney.

LOCATION AND ENVIRONMENT

The four alternative school sites surveyed, labeled as sites A, B, F, and 1 on the maps provided by the State, lie between Kuakini Highway and Ali'i Drive, about 2.4 kilometers (1.5 miles) south of the town of Kailua. Parcels* 1 and B are in the *ahupua'a* of Puapua'a I, parcel A occupies the *ahupua'a* of Puapua'a II, and parcel F lies in Holualoa I (Fig. 1). All parcels except A have been extensively bulldozed; parcel 1 is almost completely razed.

This portion of the Big Island is formed primarily of Pleistocene Age alkalic olivine basalts from Hualalai (MacDonald & Abbott 1970:304). The evolved soils are predominantly extremely rocky peats of the Punalu'u series, with localized patches of Waiaha series extremely stony silt loams (Sato et al. 1973). Both of these soils are difficult to work because of their stony nature.

Vegetation in the survey area is entirely adventive; not a single native species survives here. Leguminous trees, including *kiawe* (*Prosopis pallida*), *koa haole* (*Leucaena leucocephala*), and an unidentified species are dominant. Unidentified grasses, now brown and crisp due to drought, dominate the understory. This lack of native species is due in large part to the continued presence of grazing cattle.

Archibald Menzies' journal provides us with a description of the slopes of Hualalai as they appeared in 1793, shortly after the introduction of cattle, but before that animal's widespread environmental impact. After three miles of ascent to the Hualalai summit from Honualua, Kona, over "porous lava and volcanic dregs," his party:

*In the text of this report, to avoid confusion between archaeological sites and the alternative construction sites, the latter are referred to as land parcels.

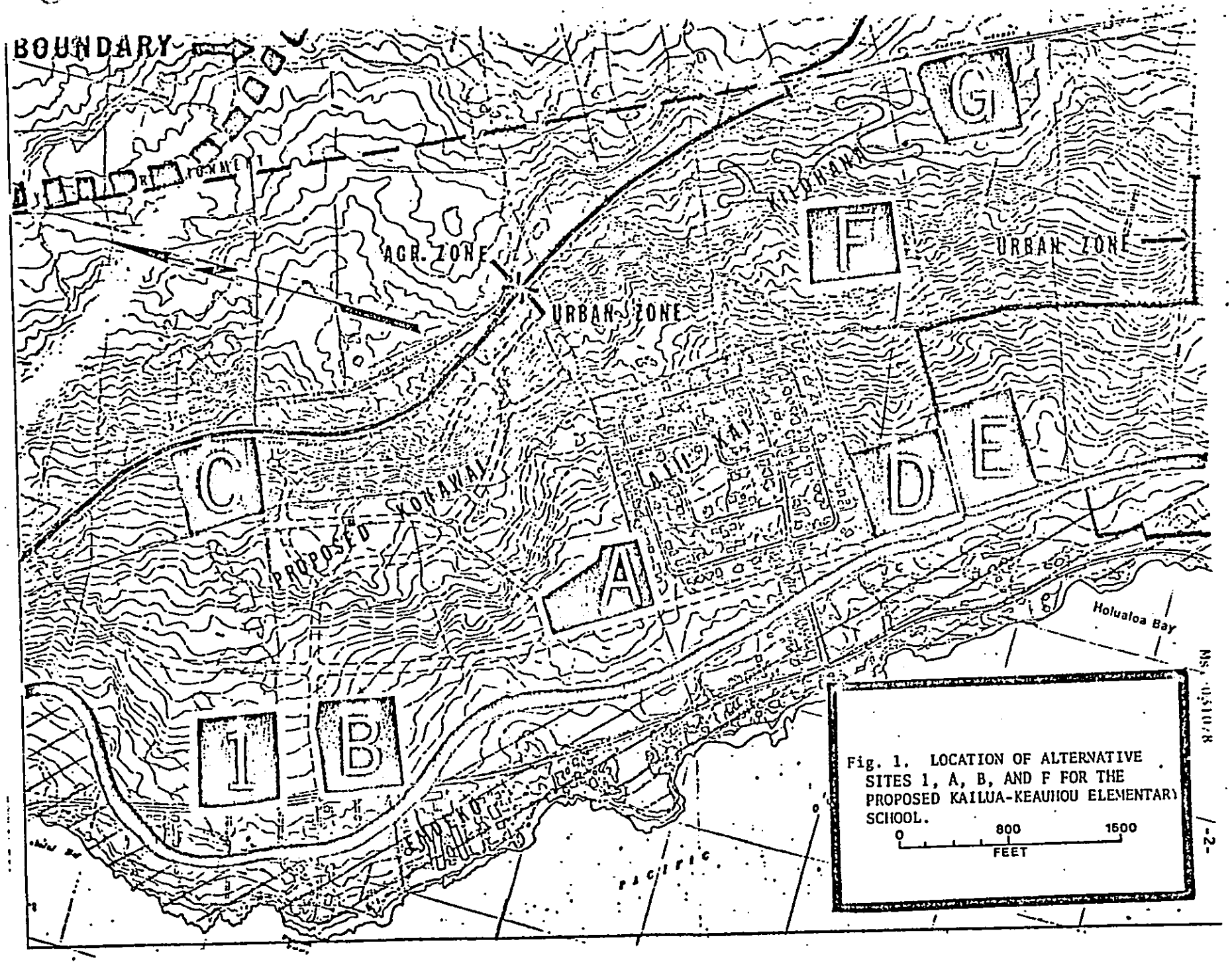

Fig. 1. LOCATION OF ALTERNATIVE SITES 1, A, B, AND F FOR THE PROPOSED KAILUA-KEAUHOU ELEMENTARY SCHOOL.

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> ...entered the breadfruit plantations whose spreading trees with beautiful foliage were scattered about that distance from the shore along the side of the mountain as far as we could see on both sides. Here the country began to assume a pleasant and fertile appearance through which we continued our ascent for about two miles further, surrounded by plantations of the esculent roots and vegetables of the country, industriously cultivated... [Menzies 1920:154].

Thus, while cattle have eradicated vast areas of native vegetation and perhaps have played a part in altering local patterns of precipitation, it appears from Menzies' description that Hualalai's lower slopes were as arid then as now. Further, a belt of agriculture starting perhaps at the 800-ft contour provided vegetable foods for people living at or near the arid coast. In this context, any features within the survey area could be expected to be habitations, rather than associated with agriculture.

PREVIOUS WORK

The only previous work within the project areas was done in 1973, during an archaeological surface survey of the proposed realignment of Ali'i Drive, south of Kailua (Ching et al. 1973). This survey of a 300-ft-wide corridor passed just *mauka* of parcels 1 and B, and touched upon the *makai* boundary of parcel A. One site, #6338 (Ching et al. 1973:108-109), classified as an "independent wall" and thought to be a "cattle fence," was recorded within the limits of parcel A.

METHODS

An archaeological reconnaissance survey is designed to determine the presence or absence of archaeological sites within a given area and to describe the general nature of these sites, allowing formulation of appropriate recommendations on the necessity and scope of mitigative actions should the land surveyed be scheduled for modification.

The State Department of Accounting and General Services, Division of Public Works, provided blueline and photocopy maps of the area to be surveyed. Two general area maps, one at 1:24,000 showing known historical sites, and the other at 1:9600, indicating the survey areas in relationship to proposed

developments, afforded overall locations. Eight maps at 1:4800 provided the relationship of alternative parcels to recognizable landmarks and landforms.

With the exception of the *makai* boundary of parcels A and B, and the *makai* and south boundaries of parcel 1, the limits of each alternative parcel were not marked in the field. Survey boundaries were estimated in the field with the use of a compass, and by either pacing or reckoning distances. Thus, the areas surveyed may not coincide exactly with the parcels as shown on Fig. 1. While all efforts were made to insure complete coverage of each alternative site, the extremeties of each may not have been completely surveyed. Conversely, archaeological sites located near parcel boundaries may actually lie outside of the parcel.

Survey areas were traversed on foot with the archaeologists spaced c. 25 meters apart. Sites were located by triangulation where possible, or more commonly, by association with prominent landforms. Selected sites were mapped with tape and compass at 1:100. All sites were photographed with 35-mm black and white film.

Site numbers were assigned according to the Bishop Museum system; 50 = State of Hawaii; Ha = Hawaii Island; D = District of North Kona; 6 = *ahupua'a* of Holualoa, 7 = Puapua'a; and the last digit is the individual site number.

RESULTS

A total of sixteen archaeological sites were recorded during reconnaissance survey. Of these, two were found in parcel 1, eight in parcel B, four in parcel A, and two in parcel F (Figs. 2, 3, 4, 5). In addition, each site will be nominated for inclusion on the Hawaii Register of Historic Places.

Parcel 1 (Fig. 2)

Bounded on the south and west by modern cattle walls, parcel 1 is the most completely bulldozed piece of land within this survey. Remnants of two archaeological sites are located on pahoehoe outcrops that had been spared the crush of heavy machinery. Both sites are partially covered with land-clearing debris, including boulders and large *kiawe* tree trunks.

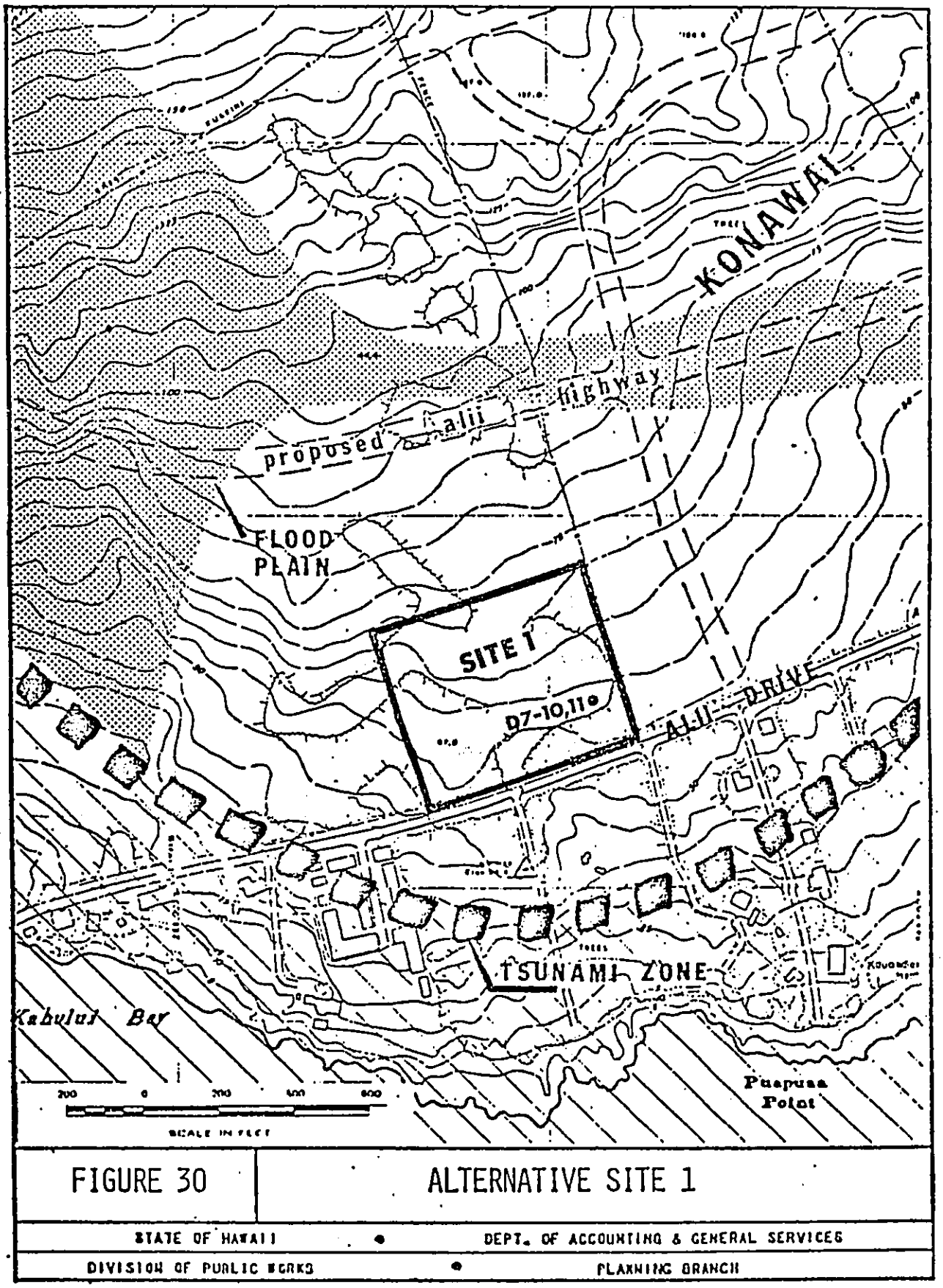


FIGURE 30	ALTERNATIVE SITE 1
STATE OF HAWAII •	DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS •	PLANNING BRANCH

Fig. 2. LOCATION OF ARCHAEOLOGICAL SITES IN ALTERNATIVE SITE 1.

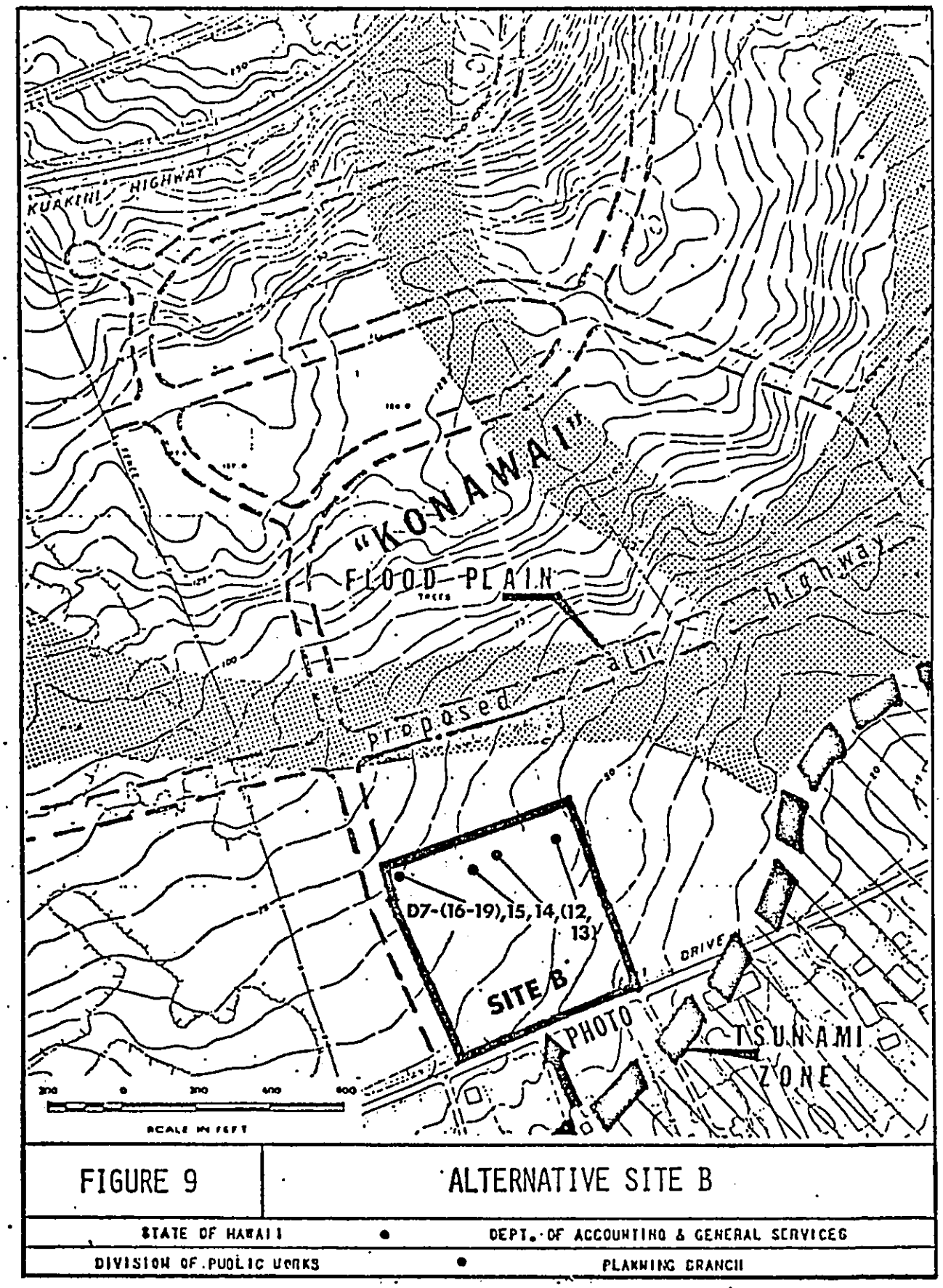


FIGURE 9	ALTERNATIVE SITE B
STATE OF HAWAII • DEPT. OF ACCOUNTING & GENERAL SERVICES	
DIVISION OF PUBLIC WORKS • PLANNING BRANCH	

Fig. 3. LOCATION OF ARCHAEOLOGICAL SITES IN ALTERNATIVE SITE B.

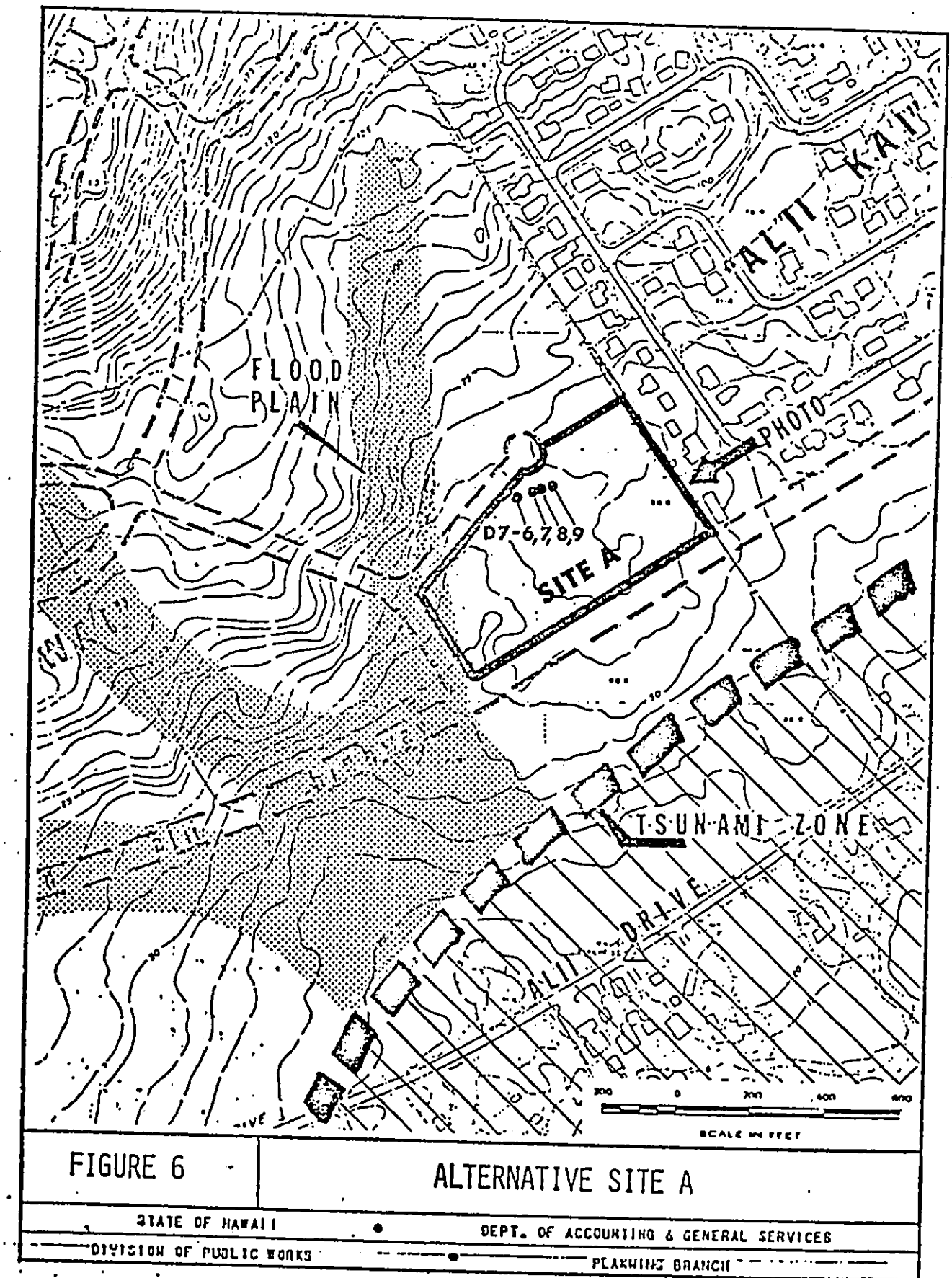


Fig. 4. LOCATION OF ARCHAEOLOGICAL SITES IN ALTERNATIVE SITE A.

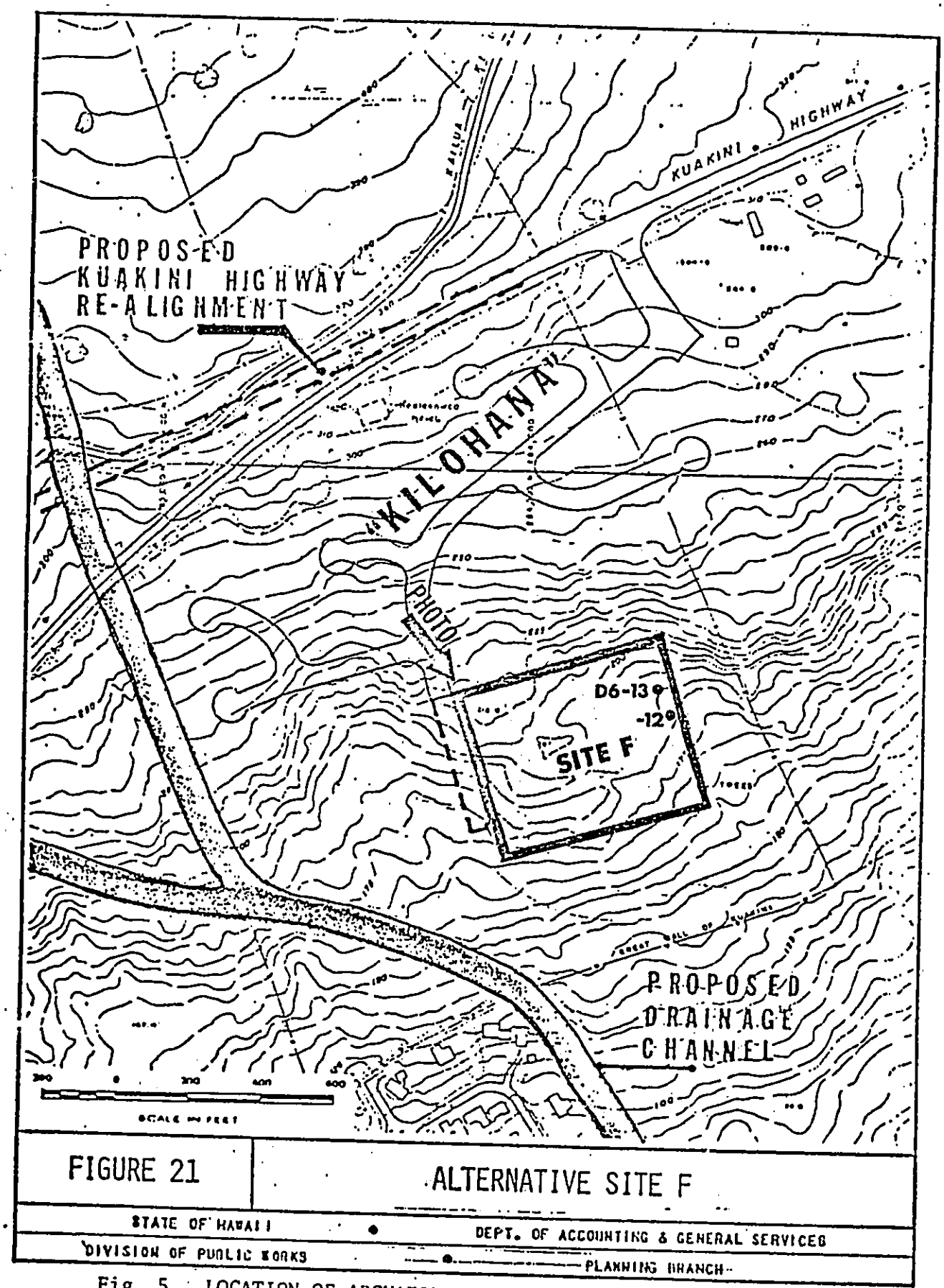


Fig. 5. LOCATION OF ARCHAEOLOGICAL SITES IN ALTERNATIVE SITE F.

Site 50-Ha-D7-10 is a free-standing stone wall, 3 meters long, 1 meter wide and 0.85 meter high, located on the south edge of a pahoehoe outcrop. No midden was found. No directly associated features remain.

Site 50-Ha-D7-11 is a stone structure, 2.5 meters long, 1.2 meters wide and 1 meter high, bordered on the west by a large pile of *kiawe* trunks. The structure has been badly disturbed by bulldozing. In its present deteriorated condition, Site D7-11 most closely resembles a stone platform with jumbled interior paving. Alternately, it could have been an enclosure, the collapsed walls of which have filled the interior.

Parcel B (Fig. 3)

Parcel B, bounded on the west by a modern cattle wall, has also seen extensive bulldozing. Only a narrow strip of land that parallels the eastern boundary of the parcel remains untouched. No sites were located in the bulldozed area. Eight sites were recorded in the remainder of the parcel.

Site 50-Ha-D7-12 is an enclosure, 2 by 3.3 meters, with partially collapsed stone walls, 1.6 meters wide and 1.1 meters high:

Site 50-Ha-D7-13 is an excavated depression, 1.5 meters in diameter and 2 meters deep, located c. 5 meters east of Site D7-12. It is interpreted as an historic-era well. Pahoehoe cobbles, apparently removed during excavation, pave an area c. 6 meters in diameter that surrounds the well shaft. The well is now partially collapsed and contains no water.

Site 50-Ha-D7-14 is a square platform with an L-shaped wall attached to its SE corner, forming a three-sided enclosure open to the west (Fig. 6). The platform measures 2.5 meters on a side and stands 0.4 meter high. It is paved with angular to subangular pahoehoe stones. A depression, c. 0.5 meter in diameter and 0.2 meter deep, is located in the platform's center. The L-shaped wall measures 2.6 meters long N-S, 2.45 meters E-W, and up to 0.6 meter high. It defines a three-sided enclosure of nearly the same dimensions as the platform.

Site 50-Ha-D7-15 is a substantial platform constructed of large pahoehoe stones, located at the edge of a pahoehoe outcrop. The platform measures 2.4 meters long, 2.0 meters wide, and reaches a maximum height of 0.95 meter. The top of the platform is not level, sloping down from E to W.

Fig. 6. VIEW OF SITE 50-Ha-D7-14, PLATFORM, IN ALTERNATIVE SITE B.

Site 50-Ha-D7-16 is a cluster of two contiguous enclosures; one is rectangular with a roughly paved interior, and the other is square and unpaved (Fig. 7).

The rectangular enclosure measures 8 by 4.8 meters and has an outside height of 0.72 meters. The walls are constructed of stacked, large, pahoehoe stones and remain in good condition. The paving of pahoehoe cobbles and stones is c. 0.25 meter deep and distributed evenly throughout the interior.

The square enclosure, c. 0.5 meter on a side and 0.78 meter high, is substantially constructed with double-faced, core-filled walls, up to 0.90 meter wide.

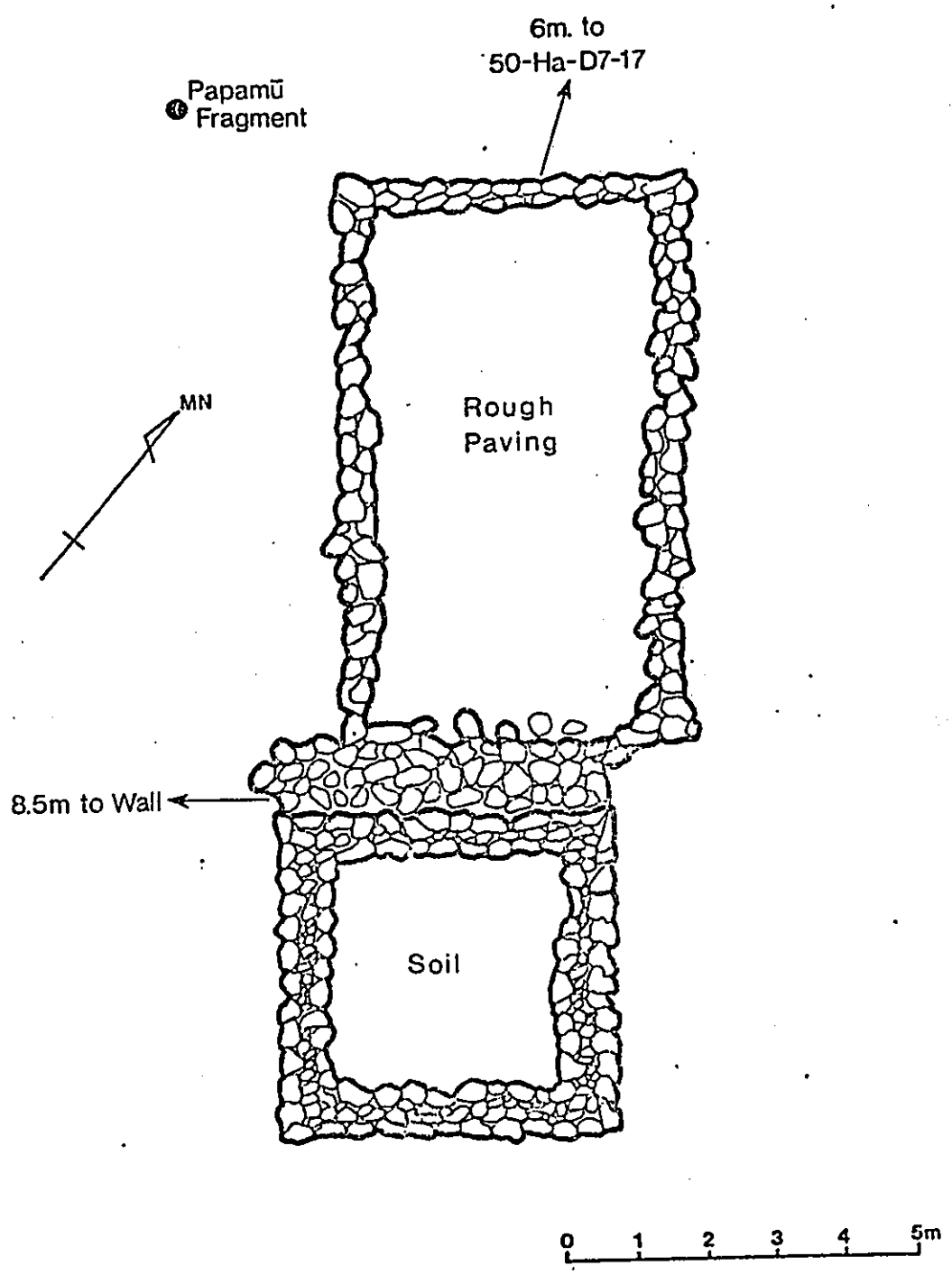
The two enclosures are connected by a 1-meter-wide jumble of stones that forms the SE end of the rectangular enclosure and abuts the outside facing of the square enclosure's NW wall. These observations suggest that the square enclosure was already standing when the rectangular enclosure was constructed.

An 8-meter-long, free-standing wall, 0.92 meter tall and 0.90 meter wide, parallels the long axis of Site D7-16, c. 8.5 meters to the SW. In addition, a portion of a *papamū*, a stone board for the Hawaiian *kōnane* game, was located 2.5 meters W of the site (see Fig. 8).

Site 50-Ha-D7-17, a cave, lies six meters north of Site D7-16. A lava tube has partially collapsed, forming a horseshoe-shaped cave along the periphery of the collapsed rubble. The cave width varies from 4 to 8 meters around the 8-meter-long "horseshoe" and the ceiling is up to 1.5 meters high. Two small walls, one on the north, the other to the east, are the dominant interior features. Each wall partitions off a c. 3-square-meter area along the lava tube wall.

A rich deposit of midden and artifacts covers the floor of D7-17. Artifacts include a basalt "breadloaf" sinker (artifact no. 50-Ha-D7-17-1) (see Fig. 9), a portion of a rectangular-section basalt adz with polished facets on parallel planes 8.5 cm apart, a coral abrader, and two hammerstones of waterworn basalt. Only the basalt sinker was collected; all other artifacts remain *in situ*.

Surface midden is plentiful and varied, and reflects the site's proximity to the sea. Molluscan remains include *Cellana* sp., *Conus* sp., *Cypraea* spp.,



50-Ha-D7-16

Fig. 7. PLAN OF SITE 50-Ha-D7-16, TWO ENCLOSURES, IN PARCEL B.

Fig. 8. PORTION OF *PAPAMU* FOUND NEAR SITE 50-Ha-D7-16.

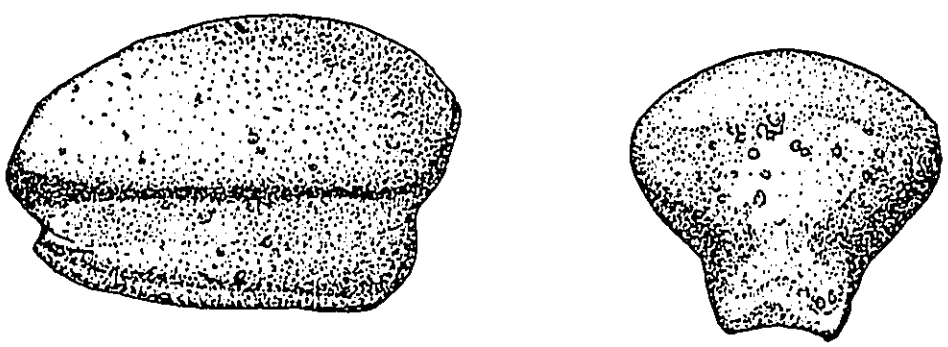


Fig. 9. BREADLOAF SINKER FROM CAVE SITE 50-Ha-D7-17, IN ALTERNATIVE SITE B.

Nerita sp., *Bursa* (?) sp., and a portion of a large gastropod shell, possibly *Charonia tritonis*. At least two species of echinoderm are present, as are waterworn basalt and coral. Floral remains include *kukui* nut (*Aleurites moluccana*) and recently deposited *kiawe* twigs and leaves. The skull of what appears to have been a small horse lies just inside the cave opening.

Artifact 50-Ha-D7-17-1, the breadloaf sinker, is 5.8 cm long, 4.0 cm wide, and 3.5 cm high. It weighs 106.4 grams. The broader end of the sinker has been truncated. Buck (1964:345) notes that this type of sinker was used on dip nets, especially those designed to capture the parrotfish, *uhu*.

Site 50-Ha-D7-18 is a stone platform, 8 meters long, 3.5 meters wide and 0.4 meter high, with an attached L-shaped wall, 2.5 meters long perpendicular to the platform's long axis, and 3.5 meters long parallel to the axis. The platform is paved with small pahoehoe cobbles, with waterworn basalt cobbles and coral included.

Site 50-Ha-D7-19 is a stone platform 3.5 meters long by 2.5 meters wide, with a step across its width dividing the platform in half. The lower half is c. 0.3 meter high, while the other half rises to a height of 0.75 meter. Larger basalt stones are used on the faces of the platform and at the step. Smaller stones and cobbles constitute the fill.

Parcel A (Fig. 4)

Alternate school site A is the only parcel surveyed that has not yet been bulldozed. It is bounded on the south by an historic-era cattle wall (Ching et al. 1973). The most numerous features here are amorphous mounds of loosely piled rocks, usually found in association with an exposed pahoehoe outcrop. Similar features at Koolaupoko, Oahu, have been shown to be clearing mounds for cattle pastures (Dye Ms.a). These sites were not assigned Bishop Museum site numbers.

Site 50-Ha-D7-6 is a tall, well-built L-shaped wall, 1.4 meters tall and 0.66 meter wide. The E-W component of the wall is 3 meters long, while the perpendicular N-S component is 4 meters long. A wooden post and attached fencing wire stand at the end of the longer wall.

Site 50-Ha-D7-7 is a well-constructed rectangular platform of basalt stones, 4 by 3.5 meters and 0.4 meter high.

Site 50-Ha-D7-8 is a small lava-tube cave with an opening c. 10 meters SW of Site D7-7. The cave is 8.5 meters long, 3.5 meters wide, and at its tallest, 0.7 meter high. Midden includes Gastropods (*Conus* sp. and *Cypraea* sp.), a single echinoderm species, coral, and *kukui* nut.

Site 50-Ha-D7-9 is a large rectangular enclosure, 13.5 by 12 meters with walls 0.45 meter high and 1.05 meters wide. Some possible interior features are badly deteriorated.

Parcel F (Fig. 5)

Alternate school site F, the most *mauka* parcel surveyed, has been almost totally bulldozed; only a small swale at the south end of the site remains untouched. A dense growth of tall grasses, now stiff and dry due to drought, make walking over the numerous bulldozed piles of loose debris a challenging endeavor. Small site remnants, such as those found in parcel 1, may remain undiscovered beneath the tall grass.

Site 50-Ha-D6-12 is a rectangular enclosure, c. 4 by 5 meters, with walls up to 0.9 meters wide and 0.9 meter high. Three amorphous rock mounds lie directly *mauka* of the enclosure. The mounds range in size from 1 by 0.75 meter to 2.5 by 6 meters and are c. 0.5 meter tall.

Site 50-Ha-D6-13 (Fig. 10) is a two-tiered stone platform, c. 13 by 16 meters, with an upright pahoehoe slab near its NE corner (Fig. 11). The first tier runs along the *makai* face of the site and is 1.5 meters wide and c. 0.5 meter high. This tier is badly deteriorated. The second tier rises 0.6 meter to the platform top, which is paved with pahoehoe cobbles. Bulldozing has proceeded to the N and E boundaries of this impressive site.

SUMMARY AND DISCUSSION

Sixteen archaeological sites were recorded during a two-day archaeological reconnaissance survey of four alternate sites for the proposed Kailua-Keauhou Elementary School. Despite bulldozing activities at three of these parcels, archaeological features are present in each parcel. Inspection of the archaeological sites indicates that both prehistoric (pre-1778) and historic (post-1778) sites are represented. Several sites have temporally distinctive

Fig. 10. SITE 50-Ha-D6-13, PLATFORM IN ALTERNATIVE SITE F.

Fig. 11. UPRIGHT PAHOEHOE SLAB IN NE CORNER OF SITE 50 HA-D6-13.

features that allow an hypothetical estimation of their ages. Others lack these features; their ages remain problematical. Subsurface testing was not included in the scope of work.

Of the four alternate school sites, parcel B exhibits the most varied and interesting complex of archaeological sites. Historic sites include the well, Site D7-13, and the large wall that parallels Ali'i Drive. Site D7-17 is a stunning example of a prehistoric dwelling cave. The inventory of surface artifacts suggests a wide range of activities at the site, including adz and fishhook manufacture, preparation of fishing apparatus, especially nets, and eating. The interior walls may delimit sleeping areas, but regardless of their functions support the hypothesized wide range of activities. Further, the cave appears to be untouched by vandals, an astounding fact in view of its proximity to Ali'i Drive. Site D7-16, two contiguous platforms, may be associated with the cave. The two phases of construction at this site and the nearby *papamū* add further interest. Site D7-19, a stepped platform, is morphologically similar to historic-era burials at Kapa'akea, Molokai (DyeMs.b).

The large, two-tiered platform in parcel F, Site D6-13, appears on the basis of its size, form, and upright stone, to be a religious structure (*heiau*). Several early surveys have recorded numerous *heiau* and related structures along the Kona coast (Stokes Ms.; Reinecke Ms.; Kekahuna Ms.), the most proximal being Kelalakowa'a, or Halehau, Heiau. This site is apparently recorded here for the first time. Site D6-12, located c. 15 meters W of D6-13, is almost certainly an associated structure. Its function, along with that of the amorphous rock mounds directly *mauka*, is unknown.

Site D7-6 in parcel A is the most obviously recent site recorded. An attached post and fence wire indicate the site's probable function as an animal pen. Nearby, Site D7-8, a cave, shows typical prehistoric-type midden with an absence of historic-era artifacts. Site D7-7, located between the above sites, offers no clues as to age. The numerous stone piles are typical features in areas cleared for cattle grazing, and augment the general impression of extensive historic modification within parcel A.

RECOMMENDATIONS

Significance of an archaeological site is based upon the site's potential for either interpretive display or further research. The cultural resources of each alternative school site are evaluated by these criteria. Proper mitigative action is then outlined. These recommendations should serve as a sound basis for a responsible choice of construction site for the proposed Kailua-Keauhou Elementary School. In an age where development and economic growth have assumed paramount importance, it is well to remember the finite and fragile nature of our cultural resources. Once destroyed, an archaeological site and the information that it contains can never be recovered.

Alternative Site 1

From an archaeological standpoint, parcel 1 is the most desirable location for the Kailua-Keauhou School. The site remnants have no interpretive potential due to their probably incomplete and severly deteriorated condition. Research potential of site remnants where context has been bulldozed away is minimal. Proper mitigative action would include accurate site location and plan-view mapping prior to commencement of construction.

Alternative Site B

Parcel B contains an array of apparently historic and prehistoric archaeological sites. The interpretive potential is minimal, however, due to the common site types represented. Site D7-17, a cave, has an outstanding potential for further archaeological investigation. Its importance is augmented by the paucity of archaeological excavation accomplished in the vicinity of vigorously growing Kailua, Kona. Interior walls hold the promise of defining discrete activity areas within the cave, while nearby Sites D7-16, -18, and -19 may help explain the role of a habitation cave in the pattern of household settlement. Mitigative action in parcel B would include: (1) location and plane-table mapping of all sites; (2) limited subsurface testing of Sites D7-12, -14, -15, -18, and -19; (3) full-scale salvage excavations at Site D7-17. It is strongly recommended that salvage excavation of Site D7-17 precede any further modification of parcel B.

Alternative Site A

As noted above, the archaeological features within parcel A suggest extensive historic-era modification of this parcel. However, Sites D7-7, -8, and -9 are of an undetermined temporal origin. Interpretive potential of these common, unimposing sites is minimal. Further research would be aimed at determining the period to which the sites belong and ascertaining the function of each. Accurate location and plane-table mapping of Site D7-6, -7, -8, and -9, with limited test excavations at Sites D7-7, -8, and -9 would mitigate the effects of school construction at this site.

Alternative Site F

It is recommended that parcel F be rejected as a potential location for the Kailua-Keauhou Elementary School on the basis of the presence of Site D6-13, posited to be a *heiau*. The potential for interpretive display of Site D6-13 is very high and construction of an elementary school affording increased access by children could possibly disturb the site beyond repair. The importance of a *heiau* to the archaeologist and to the people of Hawaii as a vestige of the Hawaiian heritage is not to be underestimated. Further work at this site would be aimed at halting the process of deterioration and restoring the platform to its original condition.

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ENVIRONMENTAL IMPACT STATEMENT

FOR THE

KAUPO WATER SYSTEM IMPROVEMENTS

Kaupo, Island of Maui, Hawaii

Submitted by
Department of Water Supply
County of Maui
Wailuku, Maui, Hawaii

Prepared by
Sam O. Hirota, Inc.
345 Queen Street, Suite 500
Honolulu, Hawaii 96813

September, 1983